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No. 105, ORIGINAL

In The

# Supreme Court of the United States

STATE OF KANSAS,

*Plaintiff,*

v.

STATE OF COLORADO,

*Defendant,*

*and*

UNITED STATES OF AMERICA,

*Defendant-Intervenor.*

**ARTHUR L. LITTLEWORTH, Special Master**
**THIRD REPORT**
**APPENDIX (EXHIBITS 1-9)**

August 2000

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**APPENDIX – Exhibit 1**

**Section XIII of Second Report (Measure of Damages – Colorado Gain or Kansas Loss)**

## SECTION XIII

## THE MEASURE OF DAMAGES – COLORADO GAIN OR KANSAS LOSS

In the event that the remedy for past depletions of usable Stateline flow should be in the form of monetary damages, Kansas contends that the measure of the remedy "should be the greater of Colorado's gains or Kansas' losses." Kan. Brief re Statement of Position at 23. Moreover, Kansas states that Colorado's benefits from violating the compact "are expected to be higher than Kansas' injury," and, if so, the amount of the recovery should correspond to the gains in Colorado resulting from the use of Kansas' entitlement. *Id.* at 4. There is no direct Supreme Court precedent on the measure of damages in a case such as this.

While this issue has been presented on briefs, earlier evidence in the trial outlines generally the kind of benefits that have accrued to Colorado farmers from increased use of groundwater. Much of the uncertainty and insecurity associated with surface flows were eliminated. Water became available when needed to improve crop yields. Total water supplies were increased for typically water-short ditches. Some high value specialty crops became possible. In short, overall farm productivity increased, but at the cost of depletions at the Stateline. The Kansas argument begins by characterizing these benefits as "ill-gotten gains," or "illegal profit," and relies on cases that do use these terms and order the divestment of the "benefits of unlawful activity." Kan. Brief re Statement of Position at 5, 8, 9. Kansas argues further that all such benefits or gains should be eliminated in order to

minimize the incentives that a state might otherwise have to violate an interstate compact or, at least, to neglect to comply therewith. *Id.* at 5, 6-7.

At the outset, I believe that Kansas' characterization of the increased use of groundwater in Colorado is unduly harsh. Most of the postcompact wells in Colorado were lawfully drilled at a time when wells were unregulated. When Kansas filed this case, there were approximately 2062 large irrigation wells, of which 1842 were in existence before 1965. Colo. Exh. 165*, Table A-1. As the Colorado Supreme Court noted in one of its decisions, there had been "virtually no regulation of wells" prior to the adoption of the 1973 Rules. Colo. Exh. 387 at 296. However, if Colorado was slow in coming to grips with well development, so was Kansas. In Kansas, about 416 wells were in existence in 1949 in the three-county area from the Stateline to Garden City. Colo. Exh. 257*. This number had increased to 1999 by 1985. *Id.*; RT Vol. 86 at 109-111. For the period 1968-85, pumping within the several canal company service areas in Kansas averaged about 79,400 acre-feet annually. It reached a high of 149,800 acre-feet in 1981. Kan. Exh. 327 at 9, Table 10A. Kansas did not begin to regulate well through the issuance of permits until 1978. RT Vol. 28 at 6; RT Vol. 37 at 27, 32.

In both states, sophisticated systems for the establishment and regulation of surface water rights had long been in place. However, before the development of the vertical turbine pump and the availability of inexpensive electrical power, there had been little regulatory need to be concerned about groundwater pumping. The "big surge" in well development along the Arkansas River



came in the 1950s and early 1960s when there was no governmental system in either Colorado or Kansas to regulate well drilling and pumping. RT Vol. 76 at 102.

Although by the 1970s the extent of pumping in Colorado was a matter of common knowledge, that is not to say, as I concluded in my earlier report, "that the impact of such pumping on usable Stateline flows was generally known or understood." Report of Special Master at 169. Wells *per se* do not violate the compact. Only if they cause a material depletion in usable Stateline flows are they wrongful. Determining what flows are usable, and the depletions of usable flow in contrast to depletions of total flow, is a complex matter. And as the Supreme Court noted in its earlier Opinion, isolating the impacts of wells on usable Stateline flow was rendered all the more difficult because of other changing conditions during the 1970s and 1980s. The 1970s were generally dry years, and some reduction in flow would have occurred apart from pumping. Pueblo Dam came on line in 1976 and began to reregulate native flows. Transmountain imports were also increased during this period, which to some extent provided an offset to pumping. The Winter Water Storage Program was instituted. Finally, there was no quantitative or specific entitlement against which depletions to usable flow could be judged. *Kansas v. Colorado* 514 U.S. 675, 131 L.Ed.2d 759, 775, 115 S.Ct. 1733 (1995).

This is not a case in which Colorado deliberately set out to reap the benefits of a wilful failure to perform its obligations under the compact. Had its actions been intentionally illegal, or as wilful and knowing as the factual situations in the cases on which Kansas relies,

there might have been more validity to Colorado's defense of laches.

Both states recognize that an interstate compact is both a contract and a law of the United States. *Petty v. Tennessee-Missouri Ridge Commission*, 359 U.S. 275, 285, 3 L.Ed.2d 804, 79 S.Ct. 785 (1959); *Texas v. New Mexico*, 462 U.S. 554, 564, 77 L.Ed.2d 1, 103 S.Ct. 2558 (1983). Thus, treating Colorado's violations of the compact as a violation of federal law, Kansas cites a number of cases upholding the equitable jurisdiction of the courts to order the disgorgement of profits illegally acquired. The leading case is *Porter v. Warner Holding Co.*, 328 U.S. 395, 90 L.Ed.1332, 66 S.Ct. 1086 (1946). That suit, brought by the Price Administration under the Emergency Price Control Act of 1942, sought restitution of rents collected in excess of required rent ceilings. The District Court enjoined future excess charges, but held that it lacked jurisdiction to order restitution. The Supreme Court found, however, that the absence of specific authority in the statute did not limit the broad equitable powers of a court to secure complete justice, and to compel the defendant to "disgorge profits." 328 U.S. at 398-99. Restitution of the excessive rent charges gave effect to "the policy of Congress," and the case was remanded so the court could "exercise the discretion that belongs to it." 328 U.S. 395 at 400, 403.

The same issue of whether a court's equitable jurisdiction was limited by the remedies authorized by the statute arose in *Mitchell v. Robert De Mario Jewelry*, 361 U.S. 288, 4 L.Ed.2d 323, 80 S.Ct. 332 (1960). In that case, several employees had sought the aid of the Secretary of Labor under the Fair Labor Standards Act to recover



wages allegedly unpaid. Ultimately, the employer retaliated by discharging the employees, and the Secretary brought suit to require reinstatement and to recover the payment of lost wages. While the statute did not specifically provide for the recovery of lost wages, the Supreme Court found that a court of equity had inherent jurisdiction to give effect to the policy of the legislature, and that the statute should not be lightly interpreted to deprive the courts of this power.

These two Supreme Court decisions are frequently cited in enforcement actions of other federal statutes, supporting the equitable power of courts to order disgorgement as a remedy "for the purpose of depriving the wrongdoer of his ill-gotten gains and deterring violations of the law." *Commodity Futures Trading Commission v. American Metals Exchange Corp.*, 991 F.2d 71 (3rd Cir. 1993). See *CFTC v. Hunt*, 591 F.2d 1211 (2nd Cir. 1979) involving the Commodity Exchange Act; *SEC v. Patel*, 61 F.3d 137 (7th Cir. 1995) involving deliberate fraud against the FDA, a 27-month term of imprisonment, and violations of the Securities Exchange Act; and *Interstate Commerce Commission v. B & T Transportation Co.*, 613 F.2d 1182 (1st Cir. 1980) involving an action under the Motor Carrier Act to enjoin the collection of charges not reflected in filed tariffs, and for restitution of the overcharges.

In these cases, we find the courts exercising equitable jurisdiction to recover excess charges, to disgorge illegal profits gained from insider trading information, and to require payment of lost wages. Each case represents an aspect of the court's broad equitable powers. At the same time, however, it is recognized that the *exercise* of such jurisdiction remains a matter of discretion:

> "The inherent equitable jurisdiction which is thus called into play clearly authorizes a court, *in its discretion*, to decree restitution of excessive charges in order to give effect to the policy of Congress." *Porter v. Warner Holding Co., supra*, 328 U.S. at 400, emphasis added.

In the context of the present case, it is my view that the quantification of damages proposed by Kansas reaches too far, and if money is to be part of the remedy, that the Court's discretion should be exercised to limit the measure of damages to the losses suffered by Kansas. As I indicated in my first Report:

> "I do not believe that Colorado officials thought they were sanctioning a compact violation in the well regulations that were established, or in their failure to adopt specific regulations to protect usable Stateline flows, or in the issuance of new well permits." Report at 169.

The lack of wilfulness behind Colorado's violation of the Compact serves to distinguish the cases cited by Kansas in support of its proposed measure of damages.

Moreover, while Kansas should be made whole with respect to past violations of the compact, it is also appropriate that the remedy not result in a windfall. If it is true that differences in soils, climate, crop values, economic multipliers or other factors may result in a higher value for Arkansas River water used in Colorado than in Kansas, reliance upon those factors to quantify damages could result in a windfall recovery. This issue surfaced in *Texas v. New Mexico* before the damages were settled by stipulation. New Mexico cited two reports prepared by Texas' economist. These reports apparently estimated that



Texas' losses from past underdeliveries were approximately 50 million dollars. On the other hand, the reports indicated that New Mexico obtained an economic benefit from the use of that water in excess of one billion dollars. While New Mexico stated that these values were grossly exaggerated, it did not dispute "the qualitative fact that New Mexico's economic benefit from not delivering a quantity of water at the state line (or her economic loss from having to deliver it) greatly exceeds the economic benefit that Texas could gain from using the same quantity of water." New Mexico's Pre-hearing Brief at 15, fn. 10. The issue of a possible windfall was not settled in *Texas v. New Mexico*. However, it does not seem appropriate that Kansas' recovery in money should exceed what would have occurred had there been no violation of the compact.

Kansas argues that quantifying damages in terms of Colorado's gain is neither a windfall nor a penalty, but rather minimizes the incentive that a state would otherwise have to evade the obligations imposed by an interstate compact. This argument was also touched upon in *Texas v. New Mexico* where the court stated:

> "It might also be said that awarding only a sum of money would permit New Mexico to ignore its obligation to deliver water as long as it is willing to suffer the financial penalty. But in light of the authority to order remedying shortfalls to be made up in kind, with whatever additional sanction might be thought necessary for deliberate failure to perform, that concern is not substantial in our view." 482 U.S. at 132.

I do not see the measure of damages suggested by Kansas as being an effective deterrent to compact violations. Interstate water cases are simply too complex to be guided by the potential form of remedy. And I have no doubt about the power of equity to provide complete relief, perhaps even looking to upstream gain under appropriate circumstances.

While an interstate compact approved by Congress becomes a law of the United States, still a "Compact is, after all, a contract." *Petty v. Tennessee-Missouri Bridge Commission*, 359 U.S. 275, 285, 3 L.Ed.2d 804, 79 S.Ct. 785 (1959); *Texas v. New Mexico*, 482 U.S. 124 at 128, 96 L.Ed.2d 105, 107 S.Ct. 2279 (1987). Ordinarily, contract damages are based upon the injured party's "expectation interest," as measured by:

(a) The loss in the value to the injured party of the other party's performance caused by its failure or deficiency, plus

(b) Any other loss, including incidental or consequential loss, caused by the breach, less

(c) Any cost or other loss that the injured party has avoided by not having to perform.

Restatement (Second) of Contracts § 347 & comment (1979). In the alternative, damages may be awarded based upon the injured party's reliance interest. *Id.* at Section 349. Thus, under general principles of contract law, money damages would not be based upon Colorado's benefit, but rather on Kansas' loss. Kansas cites some specific performance and trust cases, but those precedents are not applicable to these facts.



It should be remembered, however, that this is not merely an action at law for breach of contract. It is a case between two states brought under the original jurisdiction of the United States Supreme Court. The court's jurisdiction in such cases is "basically equitable in nature." *Ohio v. Kentucky*, 410 U.S. 641, 648, 35 L.Ed.2d 560, 93 S.Ct. 1178 (1973). Yet the court's power is not restricted by traditional equity rules. As I wrote in my earlier opinion:

> "It would be a mistake, however, to decide the issue solely on the basis of conventional equity rules. In establishing the Supreme Court's original jurisdiction over litigation between states, the constitution does not speak of 'cases in law or equity,' as it does in certain other situations. Rather it refers simply to 'controversies' between states. Commentary on the difference between cases and controversies has been inconsistent and inconclusive (see 36 CJS 20 [Federal Courts § 1]; 1A CJS 302, 315, 316 [Actions §§ 1, 5c, 6]), but the constitutional language does suggest that the interstate jurisdiction is not necessarily locked into rules of either common law or equity. And in exercising this 'unprecedented' grant of judicial power (Charles Warren, 'The Supreme Court and Sovereign States,' [Stafford Little Lectures for 1924], Princeton Univ. Press, p. 32), the Court has treated it as sui generis – a substitute for the treaty and war powers which the states surrendered when the constitution was established. *Rhode Island v. Massachusetts*, 37 U.S. (12 Pet.) 657, 725, 9 L.Ed. 1233, 1260 (1838); *Kansas v. Colorado*, 185 U.S. 125, 140, 46 L.Ed. 838, 844, 22 S.Ct. 552 (1902); *North Dakota v. Minnesota*, 263 U.S. 365, 372-73, 68 L.Ed. 342, 345, 44 S.Ct. 138

(1923); *Idaho v. Oregon*, 462 U.S. 1017, 1031, note 1, 77 L.Ed.2d 387, 400, 103 S.Ct. 2817 (1983).

As Chief Justice Taney explained in 1855, traditional chancery practice is an 'analogy' in these cases but is not controlling. *Florida v. Georgia*, 58 U.S. (17 How.) 478, 492, 15 L.Ed. 181, 189 (1855). Thus viewed, the inquiry really is one of fundamental justice rather than what is the historical or even the current practice of courts exercising less extraordinary powers. It is in this sense that the Court has observed that proceedings under its original jurisdiction are 'basically' equitable in nature. *Ohio v. Kentucky, supra*, 410 U.S. at 648, 35 L.Ed.2d at 567, 93 S.Ct. 1178 (1973)." Report at 150-51.

Most recently, the Court has indicated that the remedy in a compact case, which I deem to include the measure of damages, should provide a "fair and equitable solution that is consistent with the Compact terms." *Texas v. New Mexico*, 482 U.S. 124, 134 (1987).

A. Conclusion.

I conclude, therefore, that if a suitable remedy in this case should include money damages, those damages should be based upon Kansas' loss rather than any gain to Colorado, subject to the overriding consideration that the remedy provide a fair and equitable solution.

**APPENDIX – Exhibit 2**

**Order dated July 28, 1999 re Colorado's Motion in Limine to Exclude Evidence of Colorado's Benefits from Violations of Arkansas River Compact**

IN THE SUPREME COURT OF THE UNITED STATES

| | | |
|---|---|---|
| STATE OF KANSAS, Plaintiff, v. STATE OF COLORADO, Defendant, UNITED STATES OF AMERICA, Intervenor. | ) | No. 105 Original October Term, 1998 |

**ORDER GRANTING COLORADO'S MOTION IN LIMINE TO EXCLUDE EVIDENCE OF COLORADO'S BENEFITS FROM VIOLATIONS OF THE ARKANSAS RIVER COMPACT**

(Filed July 28, 1999)

On May 7, 1999, the State of Colorado moved the Special Master to enter an order excluding any evidence of Colorado's benefits from violations of the Arkansas River Compact. The motion was precipitated by certain Kansas expert reports in support of its claim for money damages. These reports were submitted to Colorado in accordance with a prior order, and in preparation for the trial segment on remedies scheduled to begin November 8, 1999. Included in these reports was a section entitled "Colorado's Benefits From Violations of the Arkansas River Compact." The motion is based on the claim that such evidence is contrary to one of my rulings in the Second Report. In that report, I recommended to the Supreme Court:

> "That if a suitable remedy in this case should include money damages, those damages should

> be based upon Kansas' loss rather than upon any gain to Colorado, subject to the overriding consideration that the remedy provide a fair and equitable solution." (Page 113)

On July 7, 1999, Kansas filed a brief in response to Colorado's motion, and Colorado replied on July 19, 1999.

In the briefing on certain legal issues leading to my Second Report, Kansas contended that if the remedy for past depletions should be in the form of monetary damages, the measure "should be the greater of Colorado's gains or Kansas' losses." (Second Report at 75) Kansas stated that Colorado's benefits from violating the compact were expected to be "higher than Kansas' injury," and, if so, the amount of the recovery should correspond to the gains in Colorado resulting from the use of water to which Kansas was entitled. Kansas characterized these benefits as "ill-gotten gains" or "illegal profit," and relied on a line of cases upholding the equitable jurisdiction of the courts to order the disgorgement of profits illegally acquired. However, I found that these cases were distinguishable.

Kansas' characterization of the increased use of groundwater in Colorado was, I believe, "unduly harsh." (Second Report at 76) Most of the postcompact wells in Colorado were lawfully drilled at a time when wells were simply unregulated. The situation in Kansas was similar. While both states had established sophisticated systems for the regulation of surface water rights, neither state moved quickly to address groundwater pumping. The big surge in well development along the Arkansas River occurred in the 1950s and early 1960s with the development of the vertical turbine pump and the availability of



inexpensive electrical power. However, Kansas did not begin to regulate wells through the issuance of permits until 1978, and there was "virtually no regulation of wells" in Colorado prior to 1973. (Colo. Exh. 387 at 296)

I concluded in my Second Report that this is not a case in which Colorado "deliberately set out to reap the benefits of a wilful failure to perform its obligations under the compact," and that the Kansas cases were inapplicable under the facts of this case. (Second Report at 77) Moreover, the Kansas approach opens up the possibility of a windfall. I concluded further that it did not seem appropriate that any Kansas money damages should exceed what would have occurred had there been no violation of the compact. (Second Report at 81) In short, the Second Report rejected the Kansas theory of using Colorado benefits to measure any money remedy.

The Second Report was submitted to the Supreme Court in September, 1997, and exceptions were invited. (118 Sup.Ct. 39) It is not insignificant that Kansas took no exceptions to this Report, and urged the Court to "accept" the Report.[1]

The Colorado brief in support of its motion is short and straightforward, i.e., the issue of using Colorado

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[1] The Second Report quantified shortages for the period 1950-94, and also recommended two other legal rulings in Kansas' favor, namely, (1) that the Eleventh Amendment does not bar any money damages awarded to Kansas from being based, in part, on losses incurred by its water users; and (2) that the unliquidated nature of Kansas' claim for damages does not bar the award of prejudgment interest.

benefits as a measure of damages has been decided. Kansas, however, relies upon the caveat to that ruling, namely, that it would be "subject to the overriding consideration that the remedy provide a fair and equitable solution." While not proposing now that Colorado benefits be used directly to establish a money remedy, Kansas argues:

> "Even though the presumed measure of damages is not Colorado's gains, Kansas understands the Special Master's recommendation to allow evidence of Colorado gains to show that Kansas' proposed remedy on its losses provides 'a fair and equitable solution,' which is, after all, 'the overriding consideration.' " (Kansas Response at 4)

Kansas asserts that the ruling in the Second Report does not mean that no evidence of Colorado benefits can be used for any purpose. Kansas cites the recognized rule in original actions that the Court "has always been liberal in allowing full development of the facts." (*United States v. Texas* (1950) 339 U.S. 707, 715)

Colorado responds that the Court's policy applies only to providing facts that are in some way relevant to the controversy before the Court; that the proposed evidence is not relevant; and that Colorado should not be put to the time and expense of evaluating and responding to evidence that "appears to be completely irrelevant." (Colorado's Reply at 3) However, more is involved here than mere relevancy. Kansas proposes to use evidence of a legal theory that has already been ruled inappropriate to buttress an approved legal theory. We may expect, as Kansas has already indicated, that the dollar benefits to



Colorado might exceed losses to Kansas. But that cannot color Kansas' remedy. Any money damages to Kansas must stand on their own facts and legal basis. They do not become a more "fair and equitable solution" by comparison to an improper measure.

As to the meaning of the requirement that any remedy must provide a "fair and equitable solution," I expect there will be ample opportunity to consider that language within the traditional framework of injury to Kansas. (*Texas v. New Mexico* (1987) 482 U.S. 124, 134) Even in ordinary cases, and much less in a case of original jurisdiction, there is no single prescribed formula for determining damages. Moreover, in this case, the issue of prejudgment interest must be considered. There is no absolute right to such interest, and even in admiralty cases whether it should be allowed rests "very much in the discretion of the tribunal." (*City of Milwaukee v. Cement Division, National Gypsum Co.* (1995) 515 U.S. 189, 132 L.Ed.2d 148, 115 S.Ct. 2091) Such interest is not recoverable "according to a rigid theory of compensation for money withheld, but is given in response to considerations of fairness." (*Jackson County v. United States* (1939) 308 U.S. 343, 352, 84 L.Ed. 13, 60 S.Ct. 295) Moreover, according to the United States, the liability of an individual state for prejudgment interest "remains an open question." (United States Brief on Exceptions to Second Report at 21)

For the reasons herein stated, Colorado's motion in limine is granted.

DATED: July 28, 1999.

/s/ Arthur L. Littleworth
ARTHUR L. LITTLEWORTH
Special Master

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA, COUNTY OF RIVERSIDE

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years and not a party to the within entitled action; my business address is Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502.

I am readily familiar with Best, Best & Krieger's practice for collecting and processing correspondence for mailing with the United States Postal Service. Under that practice, all correspondence is deposited with the United States Postal Service the same day it is collected and processed in the ordinary course of business.

On July 28, 1999, I served the within **ORDER GRANTING COLORADO'S MOTION IN LIMINE TO EXCLUDE EVIDENCE OF COLORADO'S BENEFITS FROM VIOLATIONS OF THE ARKANSAS RIVER COMPACT** by placing a copy of the document in a separate envelope for each addressee named below and addressed to each such addressee as follows:

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On July 28, 1999, at the office of Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502, I sealed and placed each envelope for collection and deposit by Best, Best & Krieger in the United States Postal Service, following ordinary business practices.

I declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

Executed on July 28, 1999, at Riverside, California.

/s/ Sandra L. Simmons
Sandra L. Simmons

## APPENDIX – Exhibit 3

### Section XIV of Second Report (Eleventh Amendment)

## SECTION XIV

## THE ELEVENTH AMENDMENT

A. Introduction.

If money damages are to be awarded, Colorado contends that the 11th Amendment to the United States Constitution precludes any recovery based on losses sustained by individual water users in Kansas. That Amendment provides:

> "The judicial power of the United States shall not be construed to extend to any suit in law or equity, commenced or prosecuted against one of the United States by Citizens of another State, or by Citizens or Subjects of any Foreign State."

The Amendment was adopted in 1797 out of concern that the federal courts would otherwise entertain private suits against states without regard to the sovereign immunity which they had enjoyed before ratification of the constitution. *Chisholm v. Georgia*, 2 U.S. [2 Dall.] 419, 1 L.Ed. 440 (1972). Apparently the failure to raise the issue at the constitutional convention had been something of an oversight, and there was general support for liberating the states from the prospect of adverse federal litigation, especially litigation by British creditors.

In our own time, renewed political interest in states' rights has prompted a resurgence of 11th Amendment discussion, and the Court has reviewed the origins and history of the amendment at some length. See, for example, the several opinions in *Seminole Tribe of Florida v. Florida*, 517 U.S. ___, 134 L.Ed.2d 252, 116 S.Ct. 114 (1996). The majority there held that Congress did not have the power under the Indian Commerce Clause to abrogate a

state's sovereign immunity. Even more recently, the Court has considered the scope of the *Ex parte Young* doctrine which allows suits under appropriate circumstances to proceed against state officers for injunctive relief based on alleged violations of federal law. *Idaho v. Coeur d'Alene Tribe of Idaho*, 1997 U.S. Lexis 4030. However, such a suit cannot be the functional equivalent of a suit against the state so as to render its 11th Amendment protection meaningless.

At the outset two distinctions need to be made:

(1) Unlike many 11th Amendment cases, ours does not involve the issue of jurisdiction itself. The Court has already taken jurisdiction, and in fact has determined the liability questions associated with the dispute. The questions which now implicate the 11th Amendment have to do with remedy – the extent to which the Court may look to losses sustained by farmers in Kansas when fashioning an award to the State of Kansas.

(2) In the final paragraph of its briefing on this subject (pages 40-41), Colorado refers to two types of damages which apparently it recognizes as proper under the 11th Amendment: damages based on injury to Kansas' own proprietary rights, and damages based on Kansas' role as a "quasi-sovereign."[1] Kansas has not yet

[1] "Finally, if repayment is in money, it must be limited to damages on Kansas' proprietary and quasi-sovereign interests. The Eleventh Amendment precludes an award based on the economic injuries of individual Kansas water users." Colo. Reply Brief at 40-41. Colorado also states that it does not dispute that injury to the Kansas general economy and loss of governmental revenue would be appropriate to consider. Colo. Reply Brief at 26.



pointed to proprietary losses of its own, and therefore our inquiry into the 11th Amendment at this point becomes a question of whether injuries to Kansas citizens are embraced within the concept of quasi-sovereignty, or whether there is any other basis for including the losses to Kansas water users in determining Kansas' damages.[2]

During oral argument on a draft of this Second Report, counsel for Colorado responded that damages to Kansas' proprietary rights might include reduction in the State's groundwater supplies, caused by diminished recharge from the river and increased pumping to make up for river shortages.[3] RT Vol. 169 at 58-59. Counsel also indicated that probably some losses to the general economy of Kansas could be established. *Id.* at 59. It is not clear whether these losses would be considered as injuries to proprietary or quasi-sovereign rights. Nonetheless, in determining such damages counsel acknowledged that it would be necessary to begin the analysis with losses suffered by Kansas water users as a result of the compact violations. *Id.* at 59-61. However, in his view, the 11th Amendment would preclude their inclusion in the ultimate damage figure.

[2] Kansas takes the view that its entitlement "to a complete remedy for breach of the Compact" arises from its sovereign interest as a *party* to the Compact, and not from a *parens patriae* or quasi-sovereign interest. Kan. Reply Brief at 27, emphasis added.

[3] Counsel cautioned, however, that Colorado had not engaged an economist, and his responses to my questions on damages, and how damages should be determined, were without benefit of expert help, and should be understood with that reservation. RT Vol. 169 at 58, 60.

Although not always referred to by that name, quasi-sovereignty is of long standing in our law. It does not lend itself to a "simple or exact definition." *Alfred L. Snapp & Son v. Puerto Rico*, 458 U.S. 592, 601, 73 L.Ed.2d 995, 102 S.Ct. 3260 (1982). It refers to action by a state which is not based on its own proprietary or other rights as a sovereign, nor on private interests pursued by the state as a nominal party. Rather, it is a general interest that the state has in the well-being of its citizens, and which it is fitting that the state promote and defend in court. Colorado acknowledges that a state's quasi-sovereign and *parens patriae* interests are sufficient under a number of cases to support jurisdiction here and the issuance of injunctive relief. Colo. Reply Brief at 34. But Colorado contends that these authorities should not be read as allowing a state "to make claims on behalf of individual citizens," or to collect damages "based on injuries suffered by individual water users." *Id.* at 35, 2.

Of course, this action is no mere contrivance by Kansas to obtain damages for its water users. Rather, it is the State of Kansas that seeks damages, which it contends should be measured in part by the losses suffered by individual farmers. In *Texas v. New Mexico*, counsel argued that any such damages might go into the state's general fund, "rather than benefit those who were hurt." 482 U.S. at 132, n. 7. The Supreme Court responded:

> "But the basis on which Texas was permitted to bring this original action is that enforcement of the Compact was of such general public interest that the sovereign State was a proper plaintiff. See *Maryland v. Louisiana*, 451 U.S. 725, 735-739 (1981). It is wholly consistent with that



> view that the State should recover any damages that may be awarded, money she would be free to spend in the way it determines is in the public interest." *Texas v. New Mexico*, 482 U.S. at 132 n.7.

It is the same situation here. Any damages will go to the State of Kansas, to be spent as it decides, and not to individual water users.

It is interesting to note, however, that Colorado's proposed "water remedy" seems to run contrary to its views on the 11th Amendment. Colorado proposes to make up the historic shortfall in usable Stateline flows by delivering additional quantities of water (over and above that which may be required for current compact compliance) to present and future users of Arkansas River water in Kansas. Such deliveries likely would be of direct benefit to Kansas farmers – as opposed to damages paid to the State of Kansas – as compensation for past violations of the compact. In short, Colorado seems to contend that the 11th Amendment bars money compensation to the state based on losses to its citizens, but does not preclude compensation in water which may be delivered directly to those citizens. However, in oral argument Colorado responded that any deliveries of water under a water remedy would be made at the Stateline to Kansas, not to its users. It argued that Kansas could require that the excess water be used, for example, to recharge a groundwater area of the state that had nothing to do with the compact or the Arkansas River. RT Vol. 169 at 70-73. To be sure this might be theoretically possible, but also highly unlikely. In all probability, make-up water delivered into the Arkansas River and measured at the Stateline would

go to the benefit of those ditch systems that were shorted by virtue of the compact violations.

B. The Shaping of the Law.

In my review of this subject, I have found it helpful to examine the cases more or less chronologically, since there has been some shaping of the underlying principles over the years.

At first the only interstate cases under the Court's original jurisdiction were boundary cases. By their very nature such disputes involve sovereignty. They involve territory, a piece of the state itself, and obviously the state has a direct governmental interest as a state. But citizens, residents and property owners in the affected area are also directly impacted. A judgment adjusting a boundary determines whose laws are to be obeyed, whose officials will levy taxes, whose judges will decide cases, and whose rules will be used to deraign titles and resolve commercial disputes. Substantial private gains and losses can result, and it is clear that private rights of the type contemplated by the amendment will at times be adjudicated by the federal judiciary.

Notwithstanding this inevitable involvement of private rights in boundary cases, the early Court refused to accept jurisdiction over strictly private disputes. Not surprisingly, a number of attempts to avoid this result were made, sometimes with the active participation of a plaintiff state. See e.g., *New Hampshire v. Louisiana*, 108 U.S. 76, 27 L.Ed. 656, 2 S.Ct. 176 (1883), where bonds of the State



of Louisiana were assigned to the State of New Hampshire by one of its citizens for collection by the State. All expenses of litigation were paid by the original private bondholder. No state funds could be expended in the proceedings, and any recovery had to be paid over by New Hampshire to the original bondholder. The Court found that the state could not "allow the use of its name in such a suit for the benefit of one of its citizens" in order to avoid the 11th Amendment. *Id.* at 661.

These efforts seem to have come to a head in 1904 with the Court's decision in *South Dakota v. North Carolina*, 192 U.S. 286, 48 L.Ed.448, 24 S.Ct. 269 (1904). Two brothers, bankers and brokers in New York City, owned a large number of railroad bonds on which the State of North Carolina had become liable. The State of South Dakota, by statute, arranged to accept a donation of ten of the bonds and then brought suit to enforce them in the United States Supreme Court under original jurisdiction. South Dakota also named as defendants two individuals as representatives of other bondholders. While no conditions were attached to the state's title to its bonds, the Court acknowledged that the gift was made under the "not unreasonable expectation" that South Dakota's action "might enure to his benefit as the owner of other like bonds." *Id.* at 310. The Court, in a 5 to 4 decision, with a strong dissent by Mr. Justice White, accepted jurisdiction and gave judgment for South Dakota – but only on the bonds which it directly owned. The separate cause of action in which South Dakota sought relief for the other bond holders on class action principles was summarily rejected by the majority. In short, none of the

Justices was willing to allow private claimants to ride on the coattails of this interstate suit.

The law has now been long established that the state must be more than a nominal party if the protection of the Eleventh Amendment does not apply. *Maryland v. Louisiana*, 451 U.S. 725, 737, 68 L.Ed.2d 576, 101 S.Ct. 2114 (1981); *Alfred L. Snapp & Son v. Puerto Rico*, 458 U.S. 592, 73 L.Ed.2d 995, 102 S.Ct. 3260 (1982). In order to invoke the original jurisdiction of this Court, the state must bring the action "on its own behalf and not on behalf of particular citizens." *Hawaii v. Standard Oil Company of California*, 405 U.S. 251, 258 fn. 12, 31 L.Ed.2d 184, 92 S.Ct. 885 (1972).

Shortly thereafter, in 1907, the decision in *Kansas v. Colorado*, 206 U.S. 46, 51 L.Ed. 956, 27 S.Ct. 655 (1907) established the principle of equitable apportionment of interstate streams; Kansas was allowed to sue on behalf of its citizens claiming rights to Arkansas River water. The alleged facts demonstrated a sound basis for quasi-sovereignty, but the extent of relief available in such an apportionment remained uncertain because of the factual finding that Colorado had not deprived Kansas of its share of the river. This case and its predecessor, *Kansas v. Colorado*, 185 U.S. 125, 46 L.Ed. 838, 22 S.Ct. 552 (1902) are among the cases cited more recently by the Court as examples of states successfully representing the interests of their citizens. *Alfred L. Snapp & Son v. Puerto Rico*, 458 U.S. 592, 603, 73 L.Ed.2d 995, 102 S.Ct. 3260 (1982).

Fifteen years later, in a dispute involving the Laramie River, the Court decided another interstate stream apportionment, and this time there was a judgment ordering



relief. *Wyoming v. Colorado*, 259 U.S. 419, 66 L.Ed. 999, 42 S.Ct. 552 (1922). However, on the question of the scope of relief, the decision is of limited value as a precedent since both states follow the rule of prior appropriation, and for that reason the Court held that it would use that doctrine as the standard for dividing the river between them.

Nonetheless, of special relevance to the present issue is the way in which the Wyoming decision determined each state's share of the stream. The Court based its apportionment directly on the water rights of individual water users. Moreover, in doing so, it expressly adjudicated particular water rights which happened to be in controversy. For example, the opinion discussed at length the evidence relating to one priority date which Colorado claimed under the doctrine of relation, and it was held that the correct date was substantially later. Colorado's position throughout that litigation was that the case was one solely between two states, and that the Court could not determine private water rights. The Court, however, in effect abolished the line between the two states, recognizing an interstate priority for each appropriation.

Over the next eighteen years the Court issued three additional Laramie River decisions clarifying what it had done – clarification of particular significance to the argument presented by Colorado now. In *Wyoming v. Colorado No. 2*, 286 U.S. 494, 76 L.Ed. 1245, 52 S.Ct. 621 (1932), the Court issued an injunction enforcing one of the water rights it had recognized in the original decision – thus suggesting that in 1922 it had actually adjudicated private claims on the river. Then in *Wyoming v. Colorado No. 3*, 298 U.S. 573, 80 L.Ed. 1339, 56 S.Ct. 912 (1936), the Court emphasized the overriding importance of the total

amount allowed to Colorado, but nevertheless, issued an injunction as to one specific water right which had been covered in the original decree. The result was to leave the matters somewhat uncertain as to what the Court had undertaken to do. Finally, in *Wyoming v. Colorado No. 4*, 309 U.S. 572, 84 L.Ed. 954, 60 S.Ct. 765 (1940), the Court discussed all three of the previous cases and explained what had actually been intended.

With respect specifically to the injunction issued in the 1936 decree, the Court explained (309 U.S. at 579) that "this was manifestly upon the assumption that Colorado was otherwise using the total amount of water allocated to that State." The Court added that "it was not intended to restrict Colorado in determining the use of the water of the river, according to Colorado laws and adjudications, provided the diversions did not exceed the aggregate amount of 39,750 acre feet to which Colorado was entitled . . . " The holding was that the total share allocated to each state was the true adjudication of 1922, and each state was thereafter free to adjust individual rights within its borders in accordance with its own laws. Mr. Justice Van Devanter's painstaking evaluation of individual rights in 1922 was merely a means to an end; the individual rights served only as a *basis* for the overall apportionment of the stream between Colorado and Wyoming. In short, the Court in 1922 did exactly what Colorado now says it cannot do.

Meanwhile, in the year following *Wyoming v. Colorado No. 1*, the Court reiterated its opposition to actual adjudication of private claims in a suit between states. *North Dakota v. Minnesota*, 263 U.S. 365, 68 L.Ed. 342, 44 S.Ct. 138 (1923). This time the subject was not bonds but water



damage on an interstate stream. North Dakota alleged that construction work by Minnesota upstream had caused flooding in North Dakota with resulting damage to North Dakota itself (in the amount of $5,000) and to individual farms (in the amount of over $1 million). Ultimately the Court found that Minnesota was not responsible for the damage. However, it held that on proper facts it would issue an injunction in favor of North Dakota, but would not entertain the claims of the individual farmers even though presented by the state. Simply put, it reiterated the position taken in *South Dakota v. North Carolina*.

However, I find no inconsistency in the Wyoming and North Dakota cases. In Wyoming, individual claims were recognized as a basis for determining the state's total share of the stream. In North Dakota, individual damage claims were refused recognition because recovery was sought for the claimants themselves, who were actually financing the litigation. The Court found that each of the farm owners expected "to share in the . . . damages here sought in proportion to the amount of his loss," and that it was "inconceivable" that North Dakota would prosecute the damage phase of the case without intending to turn any recovery over to the individual farm owners. 263 U.S. at 375.

On the same day as the original Wyoming decision (and by means of a one-sentence reference to the principles of that case) the Court held that a Nebraska corporation could appropriate water of the North Fork of the Republican River in Colorado, and transport it across the state line for use in Nebraska. This was true notwithstanding Colorado's claim to ownership of, and the power to regulate, all the waters within its boundaries.

*Weiland, State Engineer of Colorado, v. Pioneer Irrigation Co.*, 259 U.S. 498, 502, 66 L.Ed. 1027, 42 S.Ct. 568 (1922). There was no apportionment by the Court, but the right of Nebraska citizens to some share of this interstate stream was declared to be constitutional.

In 1938, the Court in *Hinderlider v. La Plata River & Cherry Creek Ditch Co.*, 304 U.S. 92, 82 L.Ed. 1202, 58 S.Ct. 803 (1938), reaffirmed and expanded on the principles of the Kansas and Wyoming decisions. As its title indicates, that case was not brought under the original jurisdiction, but defendant Hinderlider was the state engineer of Colorado, and defended his regulatory action on the ground that the rotation he used in managing the river in Colorado was authorized by a compact between Colorado and New Mexico. The opinion is an important pronouncement on the law of interstate streams. To begin with, the Court ruled that equitable stream apportionment between states may be accomplished by compact as well as by judgment. In doing so, the Court noted that use of the rule of prior appropriation in the Wyoming case was due to the fact that both states followed that rule, and it did not preclude the use of a different approach in other cases, such as the rotation agreed upon in the Colorado-New Mexico compact. Most important, the Court held that even private Colorado rights which had vested before the compact were subject to the compact. Colorado's share of the stream was determined by the compact, and the total of all Colorado's rights could not exceed that share. Accordingly, the early priority date of the plaintiff's appropriation was unavailing to the extent that it conflicted with the management system agreed upon between the states.



In 1943, the Court decided the second Arkansas River case, this time involving a suit brought by the State of Colorado to bar a group of Kansas citizens from prosecuting actions against water users in Colorado to adjudicate their respective rights to Arkansas River water. *Colorado v. Kansas*, 320 U.S. 383, 88 L.Ed. 116, 64 S.Ct. 176 (1943). Colorado sought a decree "that Kansas and her citizens be enjoined from litigating, or attempting to litigate, the relative rights of the two states *and their citizens*. . . . " 320 U.S. at 388, emphasis added. Colorado alleged that "no proper settlement of the relative rights of the States can be obtained in suits by Kansas appropriators and against Colorado appropriators." *Id*. The Court once again found, as it had in 1907, that Colorado was not taking more than its reasonable share and granted the injunction. But the Court also strongly urged the two states to seek a more permanent allocation through an interstate compact. The present Arkansas River Compact is expressly based on the decision in that case. Compact, Art. II.

In the latter half of this century there has been some development of the Court's attitude toward the coupling of private claims with those of a state suing as quasi-sovereign. Thus, in *Maryland v. Louisiana*, 451 U.S. 725, 68 L.Ed.2d 576, 101 S.Ct. 2114 (1981), a divided Court adopted a more favorable approach toward allowing a state to represent its citizens under that doctrine. There, Maryland and several other states challenged the constitutionality of Louisiana's "first-use" tax on natural gas, and also sought recovery of the taxes already paid. *Id*. at 728, 734. The complaint estimated the direct injuries to the plaintiff states at $1.5 million, and to their citizen

consumers of gas at $120 million. 451 U.S. at 736, note 12. Among other things, the Court said:

> "Jurisdiction is also supported by the States' interest as parens patriae. A State is not permitted to enter a controversy as a nominal party in order to forward the claims of individual citizens. See Oklahoma ex rel. Johnson v. Cook, 304 U.S. 387, 82 L.Ed. 1416, 58 S.Ct. 954 (1938); New Hampshire v. Louisiana, 108 U.S. 76, 27 L.Ed. 656, 2 S.Ct. 176 (1883). But it may act as the representative of its citizens in original actions where the injury alleged affects the general population of a State in a substantial way. See, e.g., Missouri v. Illinois, 180 U.S. 208, 45 L.Ed. 497, 21 S.Ct. 331 (1901); Kansas v. Colorado, 185 U.S. 125, 46 L.Ed. 838, 22 S.Ct. 552 (1902); Georgia v. Tennessee Copper Co., 206 U.S. 230, 51 L.Ed. 1038, 27 S.Ct. 618, (1907)." 451 U.S. at 737.

With respect to the claim for injuries suffered by individual consumers, the Court stated:

> "As the Special Master observed, individual consumers cannot be expected to litigate the validity of the First-Use Tax given that the amounts paid by each consumer are likely to be relatively small. Moreover, because the consumers are not directly responsible to Louisiana for payment of the taxes, they of course are foreclosed from suing for a refund in Louisiana's courts. In such circumstances, exercise of our original jurisdiction is proper." 451 U.S. at 739.



C. The Compact.

One of the stated purposes of the Arkansas River Compact is to settle controversies not only between the states, but also "between citizens of one and citizens of the other State." Compact, Art. I-A. The compact also defines the term "state" to include any person claiming rights to the Arkansas River under the authority of that state. Compact, Art. VII-A. In an interstate controversy a state has the power to represent the water claims of its people, and an interstate compact is binding upon the water users within a state. *Hinderlider v. La Plata River & Cherry Creek Ditch Co.*, 304 U.S. 92, 106, 82 L.Ed. 1202, 58 S.Ct. 803 (1938), *Wyoming v. Colorado*, 286 U.S. 494, 508-09, 76 L.Ed. 1245, 52 S.Ct. 621 (1932).

Thus, Kansas contends that under the compact a state and its citizens are treated as one. Kan. Reply Brief at 22. An injury to its people is an injury to the state. Kan. Brief re Statement of Position at 12. In the Laramie River disputes the Court observed that "the interests of the state are indissolubly linked with the rights of the appropriators" [i.e., the water use claimants in both states]. *Wyoming v. Colorado*, 259 U.S. 419, 468, 66 L.Ed. 999, 42 S.Ct. 552 (1922). And against a claim that certain individual water users were not bound by the decree because they were not parties to the suit, the Court stated:

> "In this the nature of the suit is misconceived. It was one between States, each acting as a quasi-sovereign and representative of the interests and rights of her people in a controversy with the other . . . Decisions in other cases also warrant the conclusion that the water claimants in Colorado, and those in Wyoming, were represented

by their respective States and are bound by the decree." *Wyoming v. Colorado*, 286 U.S. 494, 508-09, 76 L.Ed. 1245, 52 S.Ct. 621 (1932).

Colorado voices concern that an overly broad interpretation of quasi-sovereignty could create the potential for double recovery. RT Vol. 169 at 55-56. That should not be a problem here, however. The Arkansas River Compact allows each state to represent its water users, and to bind them. If losses suffered by Kansas water users are included in any damages awarded to the State of Kansas, such a judgment should seal off any later recovery attempts by individual water users. Moreover, there is a substantial question whether Kansas water users have any forum open to them, apart from the compact. In 1943 Colorado was able to enjoin the prosecution of individual water rights litigation over the use of Arkansas River water. *Colorado v. Kansas*, 320 U.S. 383, 88 L.Ed. 116, 64 S.Ct. 176 (1943). During oral argument on the draft of this Second Report, counsel for Colorado acknowledged that his view of the Eleventh Amendment, together with the prior litigation, led to the conclusion that "Kansas water users do not have a remedy"; that there is "no way" to recover their losses. RT Vol. 169 at 56-57.

D. Conclusion.

For several reasons, I believe the Court should reject Colorado's present argument that the amount of damages to be awarded to Kansas may not take into account evidence of injuries to its water users.

First, Colorado's argument is inconsistent with the basic concept of quasi-sovereignty. When the conduct of



one state toward the citizens of another state is general enough and substantial enough to call for responsive action by the second state, it is unrealistic and unfair to say that the tribunal assigned to resolve the conflict must do so without evidence of the injuries suffered by those interests which are directly affected. Quasi-sovereignty (a recognized exception under the 11th Amendment) operates to avoid such a result. It throws the mantle of the state itself over the area and people involved in order to permit a general recovery for them, albeit the recovery is payable to the state itself. So long as the suit is not a subterfuge for recovery by individuals on their individual claims, quasi-sovereignty militates against rejection of any relevant evidence of injury.

Second, the key case on this subject, *Texas v. New Mexico*, 482 U.S. 124, 96 L.Ed.2d 105, 107 S.Ct. 2279 (1987), speaks broadly of providing a remedy for past breaches. The exclusion of any otherwise admissible evidence of injury would do violence to that approach. I rely on these statements by the Court:

> "We find no merit in [New Mexico's] submission that we may order only prospective relief, that is, requiring future performance of compact obligations without a remedy for past breaches. If that were the case, New Mexico's defaults could never be remedied." 482 U.S. at 128.

> "There is nothing in the nature of compacts generally or of this Compact in particular that counsels against rectifying a failure to perform in the past as well as ordering future performance called for by the Compact. By ratifying the Constitution, the States gave this Court complete judicial power to adjudicate disputes

among them, Rhode Island v. Massachusetts, 12 Pet. 657, 720, 9 L.Ed. 1233 (1838), and this power includes the capacity to provide one State a remedy for the breach of another." 482 U.S. at 128.

"[The] lack of specific provision for a remedy in case of breach does not, in our view, mandate repayment in water and preclude damages. Nor does our opinion in 462 U.S. 554, 77 L.Ed.2d 1, 103 S.Ct. 2558 (1983), necessarily foreclose such relief. There, we asserted our authority in this original action to resolve the case judicially, rather than by restructuring the administrative mechanism established by the Compact. That authority extended to devising a method by which New Mexico's obligation could be ascertained and then quantifying New Mexico's past obligation, as the Master has now done. We have now agreed with him that New Mexico has not fully performed, and we are quite sure that the Compact itself does not prevent our ordering a *suitable* remedy, whether in water or money." 482 U.S. at 130, emphasis added.

"The Court has recognized the propriety of money judgments against a State in an original action, and specifically in a case involving a compact. In *proper original actions, the Eleventh Amendment is no barrier, for by its terms, it applies only to suits by citizens against a State.*" 482 U.S. at 130, emphasis added.

Against the background of the evidence in *Texas v. New Mexico*, which found a shortfall to Texas farmers of 340,100 acre-feet, the Court's 11th Amendment statement is certainly persuasive, and to Kansas it is dispositive. It must be acknowledged, however, that this case dealt with



the question of whether any money damages could be awarded at all, and not how they might be determined.

Third, as above noted, in the Laramie River decisions the Court has already used evidence of individual claims as the basis for an interstate apportionment of water. I see no meaningful distinction between the water right claims of the *Wyoming* cases, and looking to the entitlements of individual ditches and water users in Kansas, and the shortfalls thereto, in determining the damages of the state.

Finally, in the case at hand, the State of Kansas is the signatory to the Arkansas River Compact, and the only party that can sue to protect the Stateline flows guaranteed for use by Kansas water users. The states were urged by this Court to settle their differences by compact, which they did. If a money remedy is awarded for past compact violations, the damages should include all losses that have occurred as a result of such violations, including those suffered by individual water users, subject only to the overriding consideration that the remedy must finally be a "fair and equitable solution." *Texas v. New Mexico*, 482 U.S. 124, 134, 96 L.Ed.2d 105, 107 S.Ct. 2279 (1987). The State of Kansas would be a feeble representative if it were otherwise constrained.

The fundamental rule which I see at the heart of this entire subject is that if the Court accepts a case between states as one involving sovereignty or quasi-sovereignty, it is then regarded, in law, strictly as state litigation, and the 11th Amendment is not a factor. (See *Maryland v. Louisiana*, 451 U.S. 725, 745, 68 L.Ed.2d 576, 101 S.Ct. 2114 (1981), note 21.) To adopt the Colorado view is essentially

to allow the Eleventh Amendment to limit the "complete judicial power" given this Court to adjudicate disputes among the states. *Texas v. New Mexico, supra* at 128. The Court's original jurisdiction is a substitute for the treaty and war powers which the states surrendered when they ratified the Constitution. *Rhode Island v. Massachusetts*, 37 U.S. (12 Pet.) 657, 725, 9 L.Ed.1233 (1838); *Kansas v. Colorado*, 185 U.S. 125, 140, 46 L.Ed. 838, 22 S.Ct. 552 (1902); *North Dakota v. Minnesota*, 263 U.S. 365, 372-73, 68 L.Ed. 342, 44 S.Ct. 138 (1923). I do not believe that the Eleventh Amendment was intended to curtail this unprecedented grant of judicial power to fully adjudicate a dispute between states over the enforcement of an interstate compact.

**APPENDIX – Exhibit 4**

Section XV of Second Report (Prejudgment Interest)

## SECTION XV

## PREJUDGMENT INTEREST

In their general briefing on remedies, the states have also addressed the issue of prejudgment interest. In view of the statement in *Texas v. New Mexico*, the entitlement to post-judgment interest on any money award is apparently not in issue.[1] 482 U.S. 124, 131 n.8, 96 L.Ed.2d 105, 107 S.Ct. 2279 (1987).

Kansas argues, however, that an award of prejudgment interest is appropriate for the purpose of providing complete compensation for the injuries it has suffered as a result of Colorado's breach of the compact, whether the form of remedy is in money or water. In Kansas' view, the remedy must be in "present value terms." Kan. Brief re Statement of Position at 15. Colorado opposes such an award on equitable grounds, namely, the existence of a good faith dispute over compact compliance, the absence

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[1] In *Texas v. New Mexico*, the Special Master found an accumulated shortfall of 340,100 acre-feet, which he recommended be made up over 10 years at 34,010 acre-feet annually, together with "water interest" for any bad faith failure to deliver. 482 U.S. at 127-28. The Court noted that in the event of a water remedy, Texas would be entitled "to some form of post judgment interest for the period during which that judgment is not satisfied." *Id.* at 132, n.8. However, the Court added: "We are unpersuaded, however, that 'water interest,' rather than money, should be awarded unless and until it proves to be necessary." *Id.* Colorado states that if repayment in water is recommended, post-judgment interest would be necessary only if the water was not delivered as ordered by the Court. Colo. Reply Brief at 27. Kansas strongly disagrees since delivery of make-up water would probably have to extend over a number of years.

of any compact provisions requiring the payment of money, and because the amount of any damages is not readily ascertainable, that is, damages are unliquidated. Colo. Reply Brief at 26-33.

In essence, Colorado argues in favor of the traditional approach to prejudgment interest which allowed – and, in some jurisdictions still allows – an award of prejudgment interest *only* on a liquidated claim or a strictly construed statute. *See, e.g., Montsopoulos v. American Mut. Ins. Co.*, 607 F.2d 1185, 1190 (7th Cir. 1979), interpreting Wisconsin law; *Clements Auto Co. v. Service Bureau Corp.*, 444 F.2d 169, 189 (8th Cir. 1971), interpreting Minnesota law; *Tenneco Oil Co. v. Gaffney*, 369 F.2d 306 (10th Cir. 1966), applying Wyoming law.

The rationale underlying the distinction between liquidated and unliquidated damages, for the purpose of awarding prejudgment interest, is that the defendant should not have to pay interest on damages that cannot be readily ascertained before judgment. By the nature of the dispute, the defendant is unable to halt the accrual of interest by making payment. Rothschild, *Prejudgment Interest: Survey and Suggestion*, 77 Nw U.L. Rev. 192, 197; D.Dobbs, *Law of Remedies* § 3.6(3) (2nd Ed. 1993).

This rationale, however, "has faced trenchant criticism for a number of years." *City of Milwaukee v. Cement Div., National Gypsum Co.*, 515 U.S. 189, 132 L.Ed.2d 148, 156, 115 S.Ct. 2091 (1995). Moreover, courts have recognized that an award of prejudgment interest *is* appropriate in order to provide complete compensation. *General Motors Corp. v. Devex Corp.* 461 U.S. 648, 655-656, 76 L.Ed.2d 211, 218, 103 S.Ct. 2058 (1983); *Funkhouser v. J.B.*



*Preston Co.*, 290 U.S. 163, 168, 78 L.Ed. 243, 246, 54 S.Ct. 134 (1933); *Miller v. Robertson*, 266 U.S. 243, 257-58, 69 L.Ed. 265, 45 S.Ct. 73 (1924); *Davis Cattle Co. v. Great Western Sugar Co.*, 393 F.Supp. 1165, 1187, 1192-94 (D.Colo. 1975) (applying Colorado law), aff'd, 544 F.2d 436, 441-42 (10th Cir. 1976), cert. den., 429 U.S. 1094 (1977). Further, courts have determined that prejudgment interest may be necessary to avoid unjust enrichment of a defendant who has had the use of money or things which rightly belong to the plaintiff. *Martinez v. Continental Enterprises*, 730 P.2d (Colo. 1986). They have also recognized in some instances that, if prejudgment interest is not awarded, the defendant may have an incentive to delay payment. D. Dobbs, *Law of Remedies, supra*, § 3.6(3) and cases cited.

As a consequence, a majority of jurisdictions reject the strict, traditional approach to awarding prejudgment interest. (Rothschild, *Prejudgment Interest: Survey and Suggestion, supra*, p. 204) As early as 1933, for example, the Supreme Court stated:

> "It has been recognized that a distinction, in this respect, simply as between cases of liquidated and unliquidated damages, is not a sound one. Whether the case is of the one class or the other, the injured party has suffered a loss which may be regarded as not fully compensated if he is confined to the amount found to be recoverable as of the time of the breach and nothing is added for the delay in obtaining the award of damages. Because of this fact, the rule with respect to unliquidated damages has been in evolution, and in the absence of legislation the courts have dealt with the question of allowing

> interest according to their conception of the demands of justice and practicality." *Funkhouser v. J.B. Preston Co., supra,* 290 U.S. at 163, 168-169, 78 L.Ed. 243, 54 S.Ct. 134 (1933), citations omitted.

Although it may be only dictum, and also an admiralty case, the Court's decision in *City of Milwaukee v. Cement Division, National Gypsum Co.*, 515 U.S. 189, 132 L.Ed.2d 148, 115 S.Ct. 2091 (1995) is so recent and pointed that it must strongly influence the prejudgment interest issues. At the outset, it should be acknowledged that the case involves a maritime collision under admiralty law. The general rule in such cases has been long established that prejudgment interest should be awarded, subject only to a limited exception for "peculiar" or "exceptional" circumstances. 132 L.Ed.2d at 154. The district court in this case found such unusual circumstances. It determined that the plaintiff bore 96 percent of the responsibility for the disaster, while the City of Milwaukee bore only 4 percent of the fault, and ruled that it would have been inequitable to award prejudgment interest in light of the magnitude of plaintiff's contributory negligence. The court of appeals made its own analysis of the record and changed the apportionment of liability to two-thirds to National Gypsum and one-third to the City. It also reversed the judgment, which the Supreme Court affirmed in a unanimous decision by Justice Stevens (Justice Breyer took no part in the decision).

After appropriate apportionment, the City's one-third share of damages owed to National Gypsum was



$1.677 million, but National Gypsum also sought prejudgment interest in the sum of $5.3 million.[2] In upholding an award of prejudgment interest, the Court dismissed the City's argument of a good faith dispute over its liability as having "little weight." 132 L.Ed.2d at 155. The Court was also "unmoved" by the City's contention that an award of prejudgment interest is inequitable in a mutual fault situation. *Id.* at 157. Indeed, since liability had already been apportioned, the Court stated that a "*denial* of prejudgment interest would be unfair." *Id.* "The essential rationale for awarding prejudgment interest is to ensure that an injured party is fully compensated for its loss." *Id.* at 155.

The Court also discussed the liquidated/unliquidated damage issue, noting that the distinction had never become "so firmly entrenched in admiralty as it has been at law," and indeed has faced "trenchant criticism for a number of years." *Id.* at 156. Nearly 65 years ago the Court remarked that the rule with respect to unliquidated damages "has been in evolution." *Funkhouser v. J.B. Preston, supra,* 290 U.S. at 168-69. And while the conceptual differences have not been completely reconciled outside of the admiralty context,[3] the trend of the evolution is clear: the compensatory rationale for prejudgment interest has emerged as the dominant principle. Prejudgment

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[2] The Court did not pass on the methodology used to calculate prejudgment interest, nor upon the rate to be applied.

[3] See, for example, *Blau v. Lehman*, 368 U.S. 403, 7 L.Ed.2d 403, 82 S.Ct. 451 (1962) where prejudgment interest on unliquidated damages was denied, and *Jackson County v. United States*, 308 U.S. 343, 84 L.Ed. 313, 60 S.Ct. 285 (1939) where prejudgment interest was denied on grounds of fairness.

interest will be allowed in a majority of jurisdictions irrespective of whether the obligation underlying such interest is liquidated. Rothschild, *Prejudgment Interest: Survey and Suggestion, supra.* The Court's recent decision in *City of Milwaukee* strongly suggests that the kinds of objections to prejudgment interest raised by Colorado are now obsolete.

Kansas' claim for damages in this case certainly represents an unliquidated claim. Determining the amount of depletions to usable Stateline flow has required an extensive trial. And determining the money damages as a result of the shortfall, if that should be the remedy, has yet to be tried. However, I have concluded that the unliquidated nature of Kansas' money damages does not, in and of itself, bar an award of prejudgment interest.[4]

That is not to say, however, that Kansas is necessarily entitled to prejudgment interest on any award of money damages or remedy requiring additional water to make up the shortfall. Even in admiralty cases "such an award has never been automatic." *City of Milwaukee,* 132 L.Ed.2d at 155. Allowance of interest on damages "is not an absolute right," and whether prejudgment interest ought or ought not to be allowed rests "very much in the discretion of the tribunal which has to pass upon the subject . . . " *Id.* Interest is not recoverable "according to a

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[4] "Any fixed rule allowing prejudgment interest only on liquidated claims would be difficult if not impossible to reconcile with admiralty's traditional presumption. Yet unless we were willing to adopt such a rule – which we are not – uncertainty about the outcome of a case should not preclude an award of interest." *City of Milwaukee,* 132 L.Ed.2d at 156.



rigid theory of compensation for money withheld, but is given in response to considerations of fairness." *Jackson County v. United States,* 308 U.S. 343, 352, 84 L.Ed. 313, 60 S.Ct. 295 (1939). The Court in *City of Milwaukee* stated that it had never attempted "to exhaustively catalogue the circumstances that will justify the denial of interest," but noted that "the most obvious example" would be the plaintiff's responsibility for undue delay in prosecuting the lawsuit, citing *General Motors Corp v. Devex Corp.,* 461 U.S. 648, 657, 76 L.Ed.2d 211, 103 S.Ct. 2058 (1983). *City of Milwaukee,* 132 L.Ed.2d at 155. The Court also added: "Other circumstances may appropriately be invoked as warranted by the facts of particular cases." *Id.*

In the case at hand, depletions of usable Stateline flows in violation of the compact reach back to 1950, and Kansas seeks relief, preferably in money damages, for the total amount of the shortfall since 1950. The Court has already ruled that Kansas was not guilty of laches in bringing this action, but nonetheless Kansas did not seek to file its complaint until the end of 1985. The parties then took almost five years in preparing for trial which began in September of 1990. Whether any of the circumstances and developments that have occurred since 1950 may be considered in assessing the appropriateness of prejudgment interest should be a matter of argument and proof in future proceedings of the remedies phase of this case. Much like *Jackson County v. United States,* we are without "roots in history" in approaching the issue of damages and prejudgment interest in a case of this kind. 308 U.S. at 351, *supra.*

**APPENDIX – Exhibit 5**

Order dated January 11, 1999
re Modeling and Other Issues

IN THE SUPREME COURT OF THE UNITED STATES

| | | |
|---|---|---|
| STATE OF KANSAS, Plaintiff, v. STATE OF COLORADO, Defendant, UNITED STATES OF AMERICA, Intervenor. | ) | No. 105 Original October Term, 1998 |

**ORDER RE STATELINE DEPLETIONS FOR 1995-96**

(Filed Jan. 11, 1999)

Following the Supreme Court's approval of my First Report on liability issues, the states stipulated to depletions to usable Stateline flow for the period 1950-85 in the amount of 328,505 acre-feet. October 30, 1995 Stipulation. Thereafter, additional trial segments totaling 26 days were held concerning depletions for the period 1986-94. In my Second Report, filed in September 1997, I recommended to the Court that depletions to usable Stateline flow for the 1986-94 period be determined to be 91,565 acre-feet. No exceptions to this determination were taken by either state. The trial then proceeded to consider compact compliance for the period 1995-96.

The 1996 Use Rules adopted by Colorado became effective on June 1, 1996, and thus were applicable only to the last seven months of the 1995-96 period. Moreover, during this first partial year of operation, the Rules called for the replacement of only 60 percent of the out-of-priority depletions in Colorado. The Use Rules provided that Stateline depletions were to be determined through

use of the H-I model, employing the Durbin usable flow analysis with the Larson coefficients.

Mr. Schroeder undertook the task of updating the H-I model with appropriate new data, and with the changes necessary to represent the replacement programs then under way in Colorado. RT Vol. 175 at 9, 15. His results were presented to Kansas on October 27, 1997. Certain of the changes and new data which he had included in the model were accepted by the Kansas experts, and certain additional changes were made at Kansas' request. But at the conclusion of those meetings, certain disagreements still remained over how to model the 1995-96 period. RT Vol. 173 at 19.

Trial resumed on May 11, 1998 to consider compact compliance for 1995-96, and the modeling differences which then existed. Initially, the Kansas evidence showed Stateline depletions of usable flow in the amount of 8368 acre-feet for 1995-96. Kan. Exh. 862. The comparable Colorado figure was 6597 acre-feet. Colo. Exh. 1064; RT Vol. 173 at 34. During this trial segment, however, experts for both states indicated that these amounts needed to be revised as a result of further discussions and additional new data. These revisions were submitted to me later in the form of Jt. Exh. 182. Kansas now claims depletions of 8196 acre-feet. Colorado's model results show 6717 acre-feet. Both states also briefed the modeling issues that lead to these different results. This Order decides those issues.



A. TRANSIT LOSSES FOR TRANSMOUNTAIN WATER.

The version of the H-I model used to estimate depletions for 1986-94 was structured so that transit losses resulting from transmountain water were not available for diversion. Such losses return to the river, but were passed directly to John Martin Reservoir or the Stateline. The model did not allow those losses to be diverted by any of the canal companies. Colo. Exh. 1064 at 3; RT Vol. 174 at 27; RT Vol. 175 at 36. Mr. Schroeder had always believed that this treatment of transit losses was "improper." RT Vol. 173 at 20, 90; Colo. Exh. 1064 at 3. And the Kansas experts came to agree to the extent that a "correction" was needed. RT Vol. 175 at 36; RT Vol. 175 at 123.

In determining depletions for 1995-96, Kansas therefore changed the H-I model in regard to transit losses. RT Vol. 175 at 36. Kansas experts treated 10% of transit losses from transmountain water as consumptive, but allowed the remaining 90% to be available for diversion by the next canal company in priority. RT 173 at 91. Colorado, on the other hand, did not make such a change when it ran the model for 1995-96 depletions. This was not a situation where the Colorado experts thought that a change was unneeded, or that the Kansas change did not improve the model's representation of the system. Rather, Mr. Schroeder believed that his assignment was to update the 1986-94 version of the model, to insert the new data, and to represent the replacement plans. RT Vol. 174 at 20-22, 24. He did not understand that model deficiencies in the 1986-94 version were to be addressed. RT Vol. 174 at 24.

The impact of making this change is to increase Stateline depletions for 1995-96 by approximately 617 acre-feet.

Experts for both states are in essential agreement that this is a change that should be made. RT Vol. 173 at 91; RT Vol. 174 at 20. Moreover, Kansas experts concluded that such a change alone would not require the H-I model to be recalibrated. RT Vol. 175 at 37, 126; Kan. Exh. 865, 866. Schroeder concurred that this change would not make much difference. RT Vol. 174 at 27-28. His concern, however, is that more needs to be done, both with respect to transit losses as well as other changes "to better represent the system." RT Vol. 174 at 20-22, 27. Schroeder has consistently objected to the model's use of diversion reduction and WANT factors, but his prior efforts to eliminate these parameters have not been successful. Kansas experts agree that it would be better to remove these factors if the model could be calibrated as well without them. RT Vol. 175 at 139. However, until better data is available, it is the Kansas view that such artificial parameters must remain.

Under the circumstances, and in determining 1995-96 depletions, I find that the Kansas change in the treatment of transit losses from transmountain water should be made. I count on the experts from both states to continue to make such changes as will improve the accuracy of the H-I model, without regard to whether those changes will increase or decrease calculated depletions.



B. ACREAGE IRRIGATED BY BOTH SURFACE WATER AND SUPPLEMENTAL WELLS.

The H-I model assigns an amount of acreage in each canal service area that has access to groundwater. Initially, the model included just two categories; that is, acreage supplied with surface water only, and acreage having access to both surface and well water. In determining depletions for 1995 and 1996, a new acreage category was established for lands irrigated by well water only, referred to as "sole source" acreage. RT Vol. 174 at 101. The states agreed upon the amounts of sole source acreage. Colo. Exh. 1064 at 1; Kan. Exh. 862 at 3-4. Experts for the parties, however, were unable to agree upon the remaining acreage that had access to both surface and supplemental well water.

The Kansas estimates are shown in Table 1 of Kansas Exhibit 862. These values are consistent with the percentages that have been used previously in the H-I model, including the version used to determine depletions for 1986-94. RT Vol. 173 at 115; RT Vol. 174 at 101. Mr. Schroeder concluded, however, that these values should be changed in the model runs used for 1995 and 1996 compliance. The percentages which he used are shown in Colorado Exhibit 1064 at 5, together with a comparison of the Kansas percentages. Totaling the acreage in all canal service areas, Kansas determined that 163,000 acres were serviced by a combination of surface and groundwater, while the comparable Colorado figure was 147,000 acres. RT Vol. 174 at 102. The impact of the Colorado changes is to reduce depletions of usable Stateline flow for the years

1995 and 1996 by approximately 483 acre-feet. Jt. Exh. 182.

Recently, Colorado has developed a considerable amount of new data on wells, showing that the number of sole source wells is greater than previously understood; moreover, that the number of active wells in 1996 was substantially less than the total number of wells. RT Vol. 175 at 57; Colo. Exh. 1052. Mr. Schroeder testified that the new information showing more sole source pumping makes it "very apparent" that the original values used by Kansas are inappropriate. RT Vol. 173 at 115. For example, he pointed to the Bessemer Canal, which now shows 2605 sole source acreage out of a total of 19,130 acres. Colo. Exh. 1064 at 5; RT Vol. 173 at 115, 119-20. However, removal of the sole source acreage does not necessarily indicate the percentage of the remaining acreage that still receives both surface and groundwater. Indeed, Schroeder did not correlate the two. RT Vol. 173 at 119-20, 122. With respect to the Bessemer Canal, he simply concluded, on the basis of the permits and decrees that were reviewed, that the Colorado study was superior; that the 57% figure applied by Colorado to indicate remaining acreage receiving supplemental groundwater was more accurate than the 100% figure in the H-I model. RT Vol. 173 at 120, 122.

Based upon his belief that the H-I model thus overestimated the amount of acreage receiving supplemental water, he changed the percentage values to correspond with data developed by Colorado in 1990 for use in its Water Budget Model. RT Vol. 173 at 117-18; RT Vol. 174 at 100. The specific percentages used by Mr. Schroeder are shown in Colo. Exhibit 1064 at 5. There is nothing to



show, however, that the 1990 percentages used by Mr. Schroeder are more accurate than those included in the H-I model. The evidence on this point does not support Mr. Schroeder's changes as much as it underscores the need for better data. That process is under way and is expected to be completed in 1998.

Mr. Schroeder acknowledged that this is "still an area that will need some work, and hopefully we will improve it." RT Vol. 173 at 123. Mr. Book also supported the need for improvements, particularly in the collection of field information on acreage irrigated by wells. RT Vol. 175 at 58. He understood that this was being pursued, referring to the testimony of Bill W. Tyner.

Mr. Tyner is a registered professional engineer, employed by the Colorado Division of Water Resources as the groundwater use work group leader. RT Vol. 176 at 88. He testified to the work his group had been doing to estimate the acreage irrigated by active wells in 1995 and 1996. RT Vol. 176 at 92. This included updating the various permits and decrees which Colorado had used in its 1990 Water Budget to determine acreage irrigated by wells. At the time of his testimony, no field work had been done, but this was contemplated as part of Colorado's ongoing effort to collect data concerning sole source and supplemental well acreage. RT Vol. 176 at 104. Farmer surveys had been called for, and were to be followed up with some field verifications. RT Vol. 176 at 95. Also, his group was updating the 1985 aerial photography with satellite imagery "that will allow us to determine more accurately all acreage values." RT Vol. 176 at 96. He expected that this work would be done during 1998, allowing Colorado to do "a very good job" of

identifying acreage served only by wells, and acreage served by both wells and surface water. RT Vol. 176 at 108-09. It is significant in deciding this issue that Mr. Schroeder did not include any of the work done by Mr. Tyner, but simply went back to Colorado's 1990 data. RT Vol. 176 at 117.

I conclude, therefore, that in determining depletions for 1995 and 1996, that the acreage receiving supplemental groundwater should be represented in the H-I model by using the same percentages approved for 1986-94. This may, however, be a subject for review when Mr. Tyner's work is completed.

## C. RELEASES TO THE STATELINE.

In determining depletions for 1995-96, the states were also in disagreement over the amount of replacement water for which Colorado should receive credit. Colorado claimed credit at the Stateline for 3682 acre-feet; Kansas' analysis reduced this credit to 3068 acre-feet. Kan. Exh. 862 at 9; Kan. Exh. 864 at 3. The impact of the Kansas calculation is to increase depletions of usable flow by approximately 268 acre-feet. Jt. Exh. 182.

During five days in April and three days in May, 1996 Colorado delivered replacement water to the Stateline at the same time that Kansas called for releases from its Article II account in John Martin Reservoir. Article II water belongs to Kansas under the 1980 Operating Plan, and is released on its call, together with additional flows to offset the transit losses between the reservoir and the Stateline. The issue between the states involves an



accounting disagreement over the allocation of actual Stateline flows between Colorado's replacement deliveries and Kansas' Article II water.

Kansas expert, Dale Book, prepared a daily analysis of Stateline flows for the months of April, May and June, 1996. Kan. Exh. 1064. The purpose of his study was to determine how much of the replacement water released to the river by Colorado actually reached the Stateline. RT Vol. 174 at 129-30; Kan. Exh. 864. Book acknowledged that this effort could "get very complicated." RT Vol. 174 at 123. Nonetheless, in all but seven days during this three-month period, the states agree upon the credits to which Colorado is entitled. However, during the several days when both replacement and Article II waters were present at the Stateline, Book credited the flows first to the delivery of Kansas' Article II water, and then credited any excess to Colorado as replacement water. RT Vol. 175 at 161, 166. This reduced the total credits claimed by Colorado by some 614 acre-feet. Colorado, on the other hand, took the opposite approach, allocating Stateline flows first to replacement water and then the remainder to Article II deliveries.

Colorado's witness, Steven Witte, testified to an annual agreement with Kansas which allowed "some flexibility" in the delivery of Article II water, so that deliveries would be accomplished "over the period of a run" and not necessarily on a day-to-day basis. RT Vol. 176 at 12-13. In his judgment, Colorado's approach thus allowed full credit to Colorado for delivery of its replacement water, while still providing Kansas with all of its Article II deliveries, though perhaps not on a daily basis. RT Vol. 176 at 14, 20-21. Kansas argued, based upon its

daily flow analysis, that Colorado's methodology allowed Colorado to claim credit for water released to Kansas from its Article II account. But Kansas did not demonstrate that over time it was denied the full measure of its Article II releases. I conclude, therefore, that for 1995-96 Colorado is entitled to replacement water credit at the Stateline in the amount of 3682 acre-feet.

Fortunately, this issue is not likely to arise again. In 1997 the Offset Account was established in John Martin Reservoir. Colorado can now deliver replacement water into this account, to be released at Kansas' call. Kansas thus has two separate accounts at its disposal in John Martin Reservoir – its Article II water, and now also replacement water made available by Colorado. Testimony shows that Kansas identifies the particular account from which water is to be released.

D. THE X-Y CANAL.

In 1996 the Lower Arkansas Water Management Association purchased 66 cfs of the 69 cfs water right decreed to the X-Y Canal, and dried up most of its 7700-acre service area. RT Vol. 176 at 119; RT Vol. 174 at 110. Landowners holding rights to 3 cfs did not sell, and continued to irrigate about 180 acres. Kan. Exh. 862 at 7-8. However, the irrigation supply for those acres no longer came from river diversions, but rather from seepage and return flows collected in the canal. RT Vol. 176 at 120. The headgate of the canal has been plugged so that surface diversions from the river are no longer available. *Id.* Nonetheless, both the Lamar and Manvel Canals are located hydrologically upgradient of the X-Y Canal, and



apparently provide the source of the water collected and used to irrigate the 180 acres. RT Vol. 176 at 120; RT Vol. 175 at 66-67.

The issue is how to properly represent these changed conditions in the H-I model. Since the entire X-Y Canal right was not purchased, Kansas originally suggested that the portion of the right acquired (some 96%) be allowed to return to the river, while the remainder be applied to the land. RT Vol. 174 at 111. Mr. Schroeder, however, decided that it would be more appropriate to allow all of the diversion right to remain in the river, and to represent use on the 180 acres by 3 cfs of pumping. RT Vol. 173 at 87-88; RT Vol. 174 at 111; RT Vol. 177 at 39. Kansas experts do not object to the 100% credit in the river for the X-Y water, but disagree with the way in which the pumping was modeled.

Mr. Schroeder recognized 3 cfs of pumping in both runs of the model, that is, in the historic operation as well as in the compact run. RT Vol. 173 at 88; RT Vol. 174 at 111. This has the effect of treating the pumping as a precompact use. RT Vol. 173 at 88; RT Vol. 175 at 65-73. Colorado does not disagree that its model representation essentially increases the State's precompact pumping rights by 3 cfs. RT Vol. 177 at 39-41. Rather, it attempts to justify this treatment on the ground that such return flows and seepage were actually being collected and used during the precompact period. Mr. Book, however, was unwilling to concede this factual basis, and the Colorado evidence on historic use is sketchy at best. RT Vol. 177 at 40, 43-44; RT Vol. 176 at 120; RT Vol. 173 at 87-88; 129-32, 138-39. Colorado's early data also showed that the X-Y Canal was a losing ditch historically. Colo. Exh. 4* at B.24.

I do not believe, however, that it is necessary to reach the potentially difficult issues posed by Colorado's modeling of the X-Y situation; e.g., whether there was in fact precompact use equivalent to 3 cfs; whether any such use is already accounted for in the H-I model; whether any such use should be considered as a precompact pumping right; and if so, whether Colorado's precompact pumping right can be legally adjusted in view of my earlier determination and the approval of the Supreme Court. Kansas originally suggested an alternate approach, discussed briefly above. If, however, Colorado chooses to allow 100% credit for retiring the X-Y Canal right, then irrigation of the 180 acres should be represented by the pumping of a sufficient amount to provide a full supply, and that amount should be included in the historic sum of the model only. One of these two approaches should be used in operating the H-I model to estimate 1995-96 depletions.

E. SISSON WANT FACTORS.

The Sisson-Stubbs Canal is the "last ditch on the system." RT Vol. 173 at 89. Historically its facilities "frequently washed out," and the diversion dam was not replaced after the 1965 flood. Colo. Exh. 1064 at 2; RT Vol. 174 at 17, 19; RT Vol. 175 at 75. The Sisson right of 11 cfs has now been converted to two wells, as authorized alternate points of diversion. RT Vol. 176 at 121-22; RT Vol. 173 at 89. The H-I model was calibrated using a WANT factor set to "one" for Sisson. This represents about 60% of a full supply, and was based upon historical diversion records before the diversion dam was lost in



1965. RT Vol. 173 at 142-43. For Sisson, this was the WANT factor used in the model for 1986-94 depletions, and was also used by Kansas in estimating 1995-96 depletions. Mr. Schroeder acknowledged that a WANT factor of 1.0 is appropriate "if you look at the historic diversions" and that it "probably does produce, on average, a better prediction of diversion by the Sisson when it did divert back in pre-'70." RT Vol. 173 at 89, 142.

However, Mr. Schroeder believed that certain water uses did not show up in the records, that sometimes Sisson pumped directly from the river, and in the 1950s they began to rely partially on wells rather than always maintaining their diversion facilities. RT Vol. 173 at 89-90, 142-45. Based on this understanding, Mr. Schroeder increased the Sisson WANT factor to 1.7 in his use of the H-I model for 1995-96. This factor was intended to be "more or less representative of a full supply" if it were available. RT Vol. 173 at 89-90. Colorado, however, had no actual data on any amounts of water that might have been taken, but which were not recorded during the calibration period. RT Vol. 173 at 147. Nor was there evidence as to how any pumping in the 1950s was treated. Moreover, Mr. Schroeder's testimony itself was uncertain: "very possibly" more water was taken; the records "may not have reflected the total use under the Sisson; the early diversion records "probably" did not include some of the pumping that occurred at the river. RT Vol. 173 at 145-46.

Kansas prepared Exhibit 868 which compared observed diversions with those predicted by the H-I model using the existing WANT factor of 1.0, and with the Colorado change to 1.7. For the period of 1951-64, that

is, before the Sisson headgate was washed out, observed diversions averaged 628 acre-feet annually. The H-I model predicted 768 acre-feet, or 122% of the observed diversions. With the WANT factor change made by Colorado, the model predicted diversions of 1102 acre-feet, or 175% of the observed Sisson diversions.

I conclude that the evidence does not support the model change made by Colorado for Sisson in estimating 1995-96 depletions.

It should be noted that Mr. Schroeder's increase in the Sisson WANT factor was part of an earlier recommendation which I rejected. RT Vol. 174 at 14-15; Colo. Exh. 973. I am well aware that Mr. Schroeder has consistently objected to the WANT factors in the H-I model. But they are deeply imbedded in the structure of the model, and I doubt that they should be addressed on an ad hoc basis. Counsel for Colorado has suggested the need for a more comprehensive review that may have merit. RT Vol. 173 at 10-11. The function of the WANT factors in the H-I model is to determine how much water is needed by any particular ditch. In part, this depends upon the amount of acreage receiving river water. Colorado indicates that its recent work has identified significantly more sole source acreage (irrigated by wells only) than the model currently assumes. Counsel says that such sole source acreage should be deducted from the acreage that was historically assumed to have wanted river water. However, he adds that this is a task involving "more extensive time," and to be done with "Kansas' participation." RT Vol. 173 at 10.



## F. WILEY/SAPP ALTERNATE POINTS OF DIVERSION.

The final dispute over the 1995-96 depletions concerns modeling for the Wiley Drain and the Sapp Ditch. Precompact surface rights have been decreed to both of these ditches. Rights in the Wiley Drain flows were decreed in 1906 with appropriation dates of 1895 and 1896. RT Vol. 175 at 86. The decree for the Sapp Ditch was entered in 1909 with an 1896 priority. RT Vol. 175 at 87. Later, wells as alternate points of diversion were decreed for both ditches. Kan. Exh. 830, Case W-4496-97 for Wiley, and Case 89CW82 for Sapp. The present issue is how to model the pumping from such wells.

The amount of pumping from these wells, and the actual impact on depletions is negligible.[1] However, Kansas fears that a precedent may be involved, and claims that Colorado's modeling of the pumping "has the potential for expanded use." Kan. Exh. 862 at 2. But neither state should be apprehensive. This is a narrow decision, limited to the evidence on a situation that may be unique.

Until this point in time, pumping from the Wiley and Sapp wells has been included in the H-I model as post-compact pumping. RT Vol. 175 at 15, 21. The Colorado Water Budget treated such pumping in the same fashion. RT Vol. 175 at 21. Recently, however, when the LAWMA plan was presented, Colorado became aware of the wells

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[1] In the last two years, pumping under the Wiley Drain rights amounted to only 9 acre-feet. RT 175 at 87. And the depletion impact for 1995-96 from both Wiley and Sapp pumping is only 7 acre-feet. Jt. Exh. 182.

as alternate points of diversion, and a request was made for such recognition. Mr. Schroeder, then, in his 1995-96 modeling excluded these amounts from post-compact pumping. RT 175 at 14-15. Mr. Simpson testified that, insofar as he is aware, the alternate points of diversion for the Wiley and Sapp ditches are the only ones that have been overlooked. RT Vol. 177 at 53.

Kansas does not object to the concept that pumping under an alternate point of diversion decree may be modeled as a surface use. RT Vol. 175 at 15. Rather, it complains that the Wiley decree in particular does not provide adequate protections against enlarging the historical surface use.[2] RT Vol. 175 at 16. Mr. Book pointed out that the Wiley decree does not limit pumping to the surface right priority. RT Vol. 175 at 20. Hence, pumping could occur when water would not have been available under the surface right, which is a "junior right." RT Vol. 177 at 66. While the Wiley decree imposes a 600 acre-feet annual limit on pumping, Book also believes that historic surface diversions did not reach that amount.[3] RT Vol. 175 at 17-18.

Yet while Book testified to the potential for abuse and expanded use under the Wiley decree, he could not show

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[2] Kansas evidence concentrates on the Wiley decree that in 1978 allowed conditional pumping. Kan. Exh. 830. The Sapp decree came later, in 1994, and contains numerous conditions, including a pumping limit of 350 acre-feet annually "allocated to the Sapp Ditch priority." Kan. Exh. 830, Finding 14(c)(d).

[3] Finding No. 8 in the Wiley decree states that during years of better flow, diversions of 6 cfs occurred for approximately 60 days, for a total of about 600 acre-feet. Kan. Exh. 830.



that such increase actually occurred. He acknowledged that he did not know what the historic surface use was. RT Vol. 175 at 21. Moreover, there was no evidence of injury from any lag effect of pumping.

I conclude, therefore, that it was proper for Colorado in modeling the 1995-96 depletions to exclude the Wiley and Sapp pumping from calculations of post-compact pumping. Hopefully, this will not be a recurring kind of issue. Book testified that not many decrees for alternate points of diversion exist, and that you can't get one anymore without showing non-injury. RT Vol. 175 at 20.

G. ORDER.

In a conference call on these modeling issues, counsel agreed that I could not use Jt. Exh. 182 to make direct adjustments to the depletion figures submitted earlier; that it would be necessary to rerun the H-I model once the modeling issues had been decided. Accordingly, I hereby direct the states to rerun the model in accordance with the decisions made herein, for the purpose of determining depletions to usable Stateline flow for the years 1995-96, and that the results be forwarded to me.

DATED: January 11, 1999

/s/ Arthur L. Littleworth
Arthur L. Littleworth
Special Master

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA, COUNTY OF RIVERSIDE

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years and not a party to the within entitled action; my business address is Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502.

I am readily familiar with Best, Best & Krieger's practice for collecting and processing correspondence for mailing with the United States Postal Service. Under that practice, all correspondence is deposited with the United States Postal Service the same day it is collected and processed in the ordinary course of business.

On January 11, 1999, I served the within ORDER RE STATELINE DEPLETIONS FOR 1995-96 placing a copy of the document in a separate envelope for each addressee named below and addressed to each such addressee as follows:

John B. Draper, Esq.
Montgomery & Andrews
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Andrew F. Walch, Esq.
James J. DuBois, Esq.
U.S. Department of Justice
General Litigation Section
999 18th Street, Suite 945
Denver, Colorado 80202

On January 11, 1999, at the office of Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502, I sealed and placed each envelope for collection and deposit by Best, Best & Krieger in the United States Postal Service, following ordinary business practices.

I declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

Executed on January 11, 1999, at Riverside, California.

/s/ Sandra L. Simmons
Sandra L. Simmons

**APPENDIX – Exhibit 6**

Order dated July 28, 1999 re Depletions for 1995-96

IN THE SUPREME COURT OF THE UNITED STATES

| | | |
|---|---|---|
| STATE OF KANSAS, Plaintiff, v. STATE OF COLORADO, Defendant, UNITED STATES OF AMERICA, Intervenor. | ) | No. 105 Original<br>October Term, 1998 |

**ORDER RECOMMENDING THE AMOUNT OF DEPLETIONS OF USABLE STATELINE FLOW FOR PERIOD OF 1995-96**

(Filed July 28, 1999)

On January 11, 1999 I issued an Order directing the states to rerun the H-I model, in accordance with the decisions made in such Order, to determine depletions of usable Stateline flow for the years 1995-96. That has been done, and the results have been forwarded in the form of Joint Exhibit 183.

In accordance with the results shown in Joint Exhibit 183, I hereby find that depletions of usable Stateline flow for the 1995-96 period are 7935 acre-feet, and recommend to the Supreme Court that such depletions be determined in this amount. Joint Exhibit 183 also totals depletions of usable flow for the full 1950-96 period at 428,005 acre-feet.

The 1995-96 depletions are also based in part on Joint Exhibit 182, and Joint Exhibits 182 and 183 are hereby admitted into evidence.

DATED: July 28, 1999.

/s/ Arthur L. Littleworth
ARTHUR L. LITTLEWORTH
Special Master

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA, COUNTY OF RIVERSIDE

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years and not a party to the within entitled action; my business address is Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502.

I am readily familiar with Best, Best & Krieger's practice for collecting and processing correspondence for mailing with the United States Postal Service. Under that practice, all correspondence is deposited with the United States Postal Service the same day it is collected and processed in the ordinary course of business.

On July 28, 1999, I served the within **ORDER RECOMMENDING THE AMOUNT OF DEPLETIONS OF USABLE STATELINE FLOW FOR THE PERIOD OF 1995-96** by placing a copy of the document in a separate



envelope for each addressee named below and addressed to each such addressee as follows:

John B. Draper, Esq.
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Constitution Avenue & Tenth Street, N.W.
Washington D.C. 20530

James J. DuBois, Esq.
U.S. Department of Justice
General Litigation Section
999 18th Street, Suite 945
Denver, Colorado 80202

On July 28, 1999, at the office of Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502, I sealed and placed each envelope for collection and deposit by Best, Best & Krieger in the United States Postal Service, following ordinary business practices.

I declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

Executed on July 28, 1999, at Riverside, California.

/s/ Sandra L. Simmons
Sandra L. Simmons

**APPENDIX – Exhibit 7**

Order dated March 22, 2000 re Mitigation of Damages,
Colo. Exh. 1096

IN THE SUPREME COURT OF THE UNITED STATES

| | | |
|---|---|---|
| STATE OF KANSAS, Plaintiff, v. STATE OF COLORADO, Defendant, UNITED STATES OF AMERICA, Intervenor. | ) | No. 105 Original<br>October Term, 1998 |

**ORDER RE KANSAS' OBJECTION TO EVIDENCE ON MITIGATION**

(Filed March 22, 2000)

On December 15, 1999, Kansas filed a written objection to Colorado evidence related to mitigation of Kansas' damages arising from Colorado's compact violations. The objection dealt specifically with certain portions of Professor Wichelns' expert report (Colo. Exh. 1096) and his testimony on the subject. Colorado filed a written response on March 14, 2000.

In Professor Wichelns' view, a number of "opportunities" existed to mitigate damages to those lands irrigated with surface water only. Colo. Exh. 1096 at 90. Primary emphasis was on the claim that such farmers "could have mitigated their damages" by drilling wells. *Id.* at viii. Additionally, however, the report suggests that such farmers could have mitigated potential economic losses from depletions of usable Stateline flows by: (1)

participating in government set-aside programs; (2) signing a long-term contract to remove acreage from farming under the Federal Conservation Reserve Program; (3) taking out all-risk crop insurance under the Federal Crop Insurance Act of 1938; and (4) applying for federal disaster payments. Colo. Exh. 1096 at 90-104.

The doctrine of avoidable consequences, or mitigation of damages, holds that a party cannot recover damages that it could have avoided through reasonable efforts. Stated affirmatively, an aggrieved party must make reasonable efforts to lessen its damages, depending upon the circumstances of the case. *Berger v. Iron Workers Reinforced Rodmen, Local 201*, 170 F.3d 1111 (D.C.Cir. 1999); *Hidalgo Properties, Inc. v. Wachovia Mortgage Co.*, 617 F.2d 196, 200 (10th Cir. 1980). The defendant bears the burden of proving that the plaintiff failed to take reasonable steps to mitigate its damages. *Jones v. Consolidated Rail Corp.*, 800 F.2d 590, 593 (6th Cir. 1986); *Pennzoil Producing Co. v. Offshore Express, Inc.*, 943 F.2d 1465, 1475 (5th Cir. 1991) (citing *Tennessee Valley Sand & Gravel Co. v. M/V DELTA*, 598 F.2d 930, 933 (5th Cir. 1979). The duty to mitigate damages does not arise until the injured party has reason to know that a breach has occurred. *Oddi v. AYCO Corp.*, 947 F.2d 257, 264 (7th Cir. 1991); *United States v. Karlen*, 645 F.2d 635, 640 (8th Cir. 1981).

Under the circumstances of this case, Colorado has the burden of proving that Kansas did not undertake reasonable measures to mitigate its damages after the compact violations were known. Colorado acknowledges this to be the rule. Colo. Response at 3. Much of Professor Wichelns' evidence, however, focused on the opportunity,



as well as the economic advantages, of drilling supplemental wells in the 1950s and 1960s before the compact violations were known. Colo. Exh. 1096 at 93-97, Table CO-N1. I found in my First Report, and the Supreme Court affirmed, that the extent of postcompact well pumping in Colorado was not generally known until approximately 1968. First Report, at 169; *Kansas v. Colorado*, 514 U.S. 673, 688-689 (1995). Even in the 1970s, when the extent of pumping in Colorado was a matter of common knowledge, it does not necessarily mean that the impact of such pumping on usable Stateline flows was generally known or understood. First Report, at 169.

Moreover, Colorado was certainly in a position to be aware of any compact violations as early in time as Kansas. Whenever that may have occurred, Colorado also could have reduced potential damages in Kansas by compact compliance. A damage award will not be reduced on account of damages which the defendant could have avoided as easily as the plaintiff. *Buras v. Shell Oil Co.*, 666 F.Supp.919, 924-25 (S.D. Miss. 1987) (citing *Shea-S & M Ball v. Massman-Kiewit-Early*, 606 F.2d 1245, 1249 (D.C. Cir. 1979).

In its written response, Colorado agrees that Kansas' duty to mitigate did not arise prior to its knowledge of the compact violations, and Colorado puts this date at 1984. Colo. Response at 3. Colorado states that in 1984 Kansas received an engineering report which concluded that postcompact well pumping in Colorado had depleted usable Stateline flows. *Id.*, fn. 1 at 3. Colorado suggests, however, if the values of water estimated by the Kansas experts are reasonable, then allowing the construction of

additional wells "would have been a reasonable means to mitigate damages after 1984." *Id.*

With respect to the claim that Kansas farmers, at any time, should have drilled supplemental wells to irrigate those lands having access only to surface flows of the Arkansas River, I find such claim to be unreasonable. Aside from the substantial capital costs required to develop such pumping systems,[1] Kansas should not be required to further deplete its groundwater resources. Depletions of usable Stateline flows, over the 1950-94 period, have reduced groundwater recharge from the river and from canal, ditch and reservoir seepage by 224,424 acre-feet. 1998 Stipulation, Table 4B, Cols. ah, ai, aj, and 2nd Col. from right. When replacement pumping is added to these recharge losses, the total impact on Kansas groundwater is 324,866 acre-feet. 1998 Stipulation, Table 4B, last column to right. Together, the reduced groundwater recharge and the increased pumping, have resulted in lowering groundwater levels over a wide region from 0.5 feet along the perimeter to over 8.0 feet in the central part. Kan. Exh. 874 at 8, Fig. 2. These are permanent losses, both as to the loss of groundwater in storage, and as to increased pump lifts. Kan. Exh. 892, Section B at 4.

These impacts on Kansas groundwater resources go far beyond the ditch service areas of the Kansas canal

---

[1] Although Colorado's expert economist, with hindsight, might demonstrate the profitability of drilling new wells, it is understandable that farmers at the time might not have had the capital available, or the willingness to assume a long term debt. Colo. Exh. 1096 at 93 *et seq.*



companies. The canals deliver surface water from the Arkansas River to about 44,000 acres, while the regional area of affected groundwater contains about 790,000 acres. 1998 Stipulation, Table 4B; Kan. Exh. 874 at 9. Pumping in the entire region, including the ditch service areas, has increased substantially over the years, from about 77,000 acre-feet in 1951 to about 718,000 acre-feet in 1988. Kan. Exh. 874 at 12. The region is severely overdrafted. A 1985 USGS study covering about 850,000 acres in Kearny and Finney Counties estimated that about 531,700 acre-feet were withdrawn from groundwater storage during the period of 1974-1980. Jt. Exh. 140 at 1, Table 1 at 37. To be sure, most of the increased pumping and overdraft results from the actions of water users in Kansas that are unrelated to river depletions caused by Colorado. Nonetheless, I do not believe that it is reasonable as a matter of law to call for still more pumping, causing further damage to Kansas and a permanent loss of more groundwater resources, in order to alleviate other damages caused by Colorado. Mitigation is not meant to result in substitute damage.

I am aware that Colorado uses evidence of potential increases in net farm income from pumping groundwater in order to argue that the values of water in the Kansas analysis are excessive. This Order is not meant to exclude evidence for that purpose. It is related only to the legal duty to mitigate.

Concerning the remaining mitigation "opportunities" cited by Professor Wichelns, I find that Colorado falls far short of meeting its burden of proof, even if some of these programs might qualify legally as appropriate mitigation measures. It is not sufficient to state that such programs

would "likely" offset farm losses. Colo. Exh. 1096 at viii, 91, 98, 102. None of the data discussed in connection with government price support programs, the conservation reserve program, crop insurance, or federal disaster payments, was directed to the lands within the canal service areas, let alone to the surface water only lands. Nor do such data and discussion show whether the surface water only lands would actually have qualified under any of the programs; or if so, what the costs and consequences might have been; or what amounts might have been recovered to offset any damages incurred by virtue of the depletions.

Accordingly, I find that it is not reasonable as a matter of law to require Kansas to mitigate its loss of surface flows from the Arkansas River by additional well pumping, and that the remaining mitigation measures proposed are too speculative to be considered. The Kansas objection is sustained, and the specific portions of Colo. Exh. 1096 identified in the Kansas motion are stricken, together with any testimony of Professor Wichelns in support thereof.

DATED: March 22, 2000

/s/ Arthur L. Littleworth
ARTHUR L. LITTLEWORTH
Special Master

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA, COUNTY OF RIVERSIDE

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years



and not a party to the within entitled action; my business address is Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502.

I am readily familiar with Best, Best & Krieger's practice for collecting and processing correspondence for mailing with the United States Postal Service. Under that practice, all correspondence is deposited with the United States Postal Service the same day it is collected and processed in the ordinary course of business.

On March 22, 2000, I served the within **ORDER RE KANSAS' OBJECTION TO EVIDENCE ON MITIGATION** by placing a copy of the document in a separate envelope for each addressee named below and addressed to each such addressee as follows:

John B. Draper, Esq.
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I declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

Executed on March 22, 2000, at Riverside, California.

/s/ Sandra L. Simmons
Sandra L. Simmons

**APPENDIX – Exhibit 8**

Order dated May 1, 2000 re Objection to
Expert Testimony
(*Daubert* Motion)

IN THE SUPREME COURT OF THE UNITED STATES

| | | |
|---|---|---|
| STATE OF KANSAS,<br>Plaintiff,<br>v.<br>STATE OF COLORADO,<br>Defendant,<br>UNITED STATES OF AMERICA,<br>Intervenor. | ) | No. 105 Original<br>October Term, 1999 |

**ORDER OVERRULING COLORADO'S OBJECTION TO THE ADMISSIBILITY OF EXPERT TESTIMONY REGARDING SECONDARY ECONOMIC DAMAGES**

(Filed May 1, 2000)

The Kansas claim for damages includes secondary or indirect economic losses to the Kansas economy resulting from the increased costs of pumping and crop production losses. Kansas employed two widely recognized experts, Professor Joel R. Hamilton and Dr. M. Henry Robison, to estimate these secondary economic damages. At the conclusion of the cross-examination of these experts, Colorado made an objection to the admissibility of all testimony concerning the analysis of secondary economic impacts. RT Vol. 187 at 54. The objection was based upon the argument that the testimony and exhibits of the Kansas experts did not meet the tests for expert testimony set forth in the *Daubert* and *Kumho Tire Co.* cases.[1] Colorado

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[1] *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993); *Kumho Tire Co., Ltd. v.*

filed a written brief in support of its objection, and Kansas was given the opportunity to reply. Colorado also renewed its "gatekeeper" objection to keep Professor Hamilton off the stand when he returned to testify on rebuttal. RT Vol. 206 at 7. That objection was overruled, and the testimony and evidence on secondary economic damages was completed. However, the basic Colorado objection, in essence a motion to strike, was taken under submission. RT Vol. 206 at 6.

Rule 702 of the Federal Rules of Evidence provides:

> "If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise."

In the *Daubert* case, the U.S. Supreme Court addressed the admissibility of scientific expert testimony under this Rule. The case involved the use of a prescription drug, Bendectin, taken during pregnancy, and the allegation that it had caused serious birth defects. A summary judgment was granted on behalf of the defendant drug company based upon a vast body of epidemiological data concerning the drug. The plaintiff's expert testimony, which relied upon animal-cell and live animal studies, and chemical structure analyses, was ruled inadmissible. Relying upon *Frye*,[2] the trial court found that these

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*Carmichael*, 526 U.S. ___, 119 S.Ct. 1167, 143 L.Ed.2d at 238 (1999).

[2] *Frye v. United States*, 54 App. DC 46, 293 F. 1013 (1923).



studies were not "generally accepted" by the scientific community as being reliable.

The Supreme Court recognized that the "general acceptance" test had been the dominant standard for some 70 years since the *Frye* case, but nonetheless sharp divisions existed among the courts. The Court noted that the *Frye* decision predated Rule 702, and held that the general acceptance test, as the exclusive standard for admissibility of expert scientific testimony, was incompatible with the Federal Rules. The Rules, said the Court, assign to the trial judge "the task of ensuring that an expert's testimony both rests on a reliable foundation and is relevant to the task at hand." 509 U.S. at 597. The Court emphasized that the Rule 702 inquiry is a "flexible one." *Id.* at 594.

The Court also discussed specific factors such as testing, peer review, error rates, and general acceptability in the scientific community, which might prove helpful in determining the admissibility of a particular scientific "theory or technique." *Id.* at 593-94. These factors are nicely summarized in the *Kumho Tire* case,[3] but the Court makes it clear that they "may or may not be pertinent in assessing reliability." 143 L.Ed. 2d at 251. They can neither be ruled out, nor ruled in, since "Too much depends upon the particular circumstances of the particular case at issue." *Id.* at 252. The objective of the *Daubert* gatekeeping obligation, said the Court, is "to enforce the reliability and relevancy of expert testimony," and in this inquiry

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[3] *Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S.___, 143 L.Ed. 2d 238, 119 S.Ct. 1167.

the trial court "must have considerable leeway." *Id.* at 252.

The *Kumho Tire* case involved the blowout of a tire, claimed to be defective by design or manufacture, which resulted in the death of a passenger. While the plaintiff's expert testimony was more technical than scientific the Court held that the *Daubert* ruling applies not only to scientific expert testimony, but to "all expert testimony." *Id.* at 250. In the case at hand, the Colorado objection relates to the testimony of one expert qualified in the area of "agricultural economics," and the other in the area of "economic modeling." RT Vol. 185 at 66; RT Vol. 186 at 55. Clearly they are both subject to the principles in the *Daubert* and *Kumho Tire* cases.

The secondary impacts to the Kansas economy as a whole were estimated through a process known as an input-output analysis. This process traces the ripple effects of the depletions within the ditch service areas, and the lowered groundwater levels in the adjacent region, throughout the statewide economy. The study of secondary economic impacts as part of the discipline of economics dates back to the mid-eighteenth century in France. RT Vol. 185 at 68. However, it was not until the 1930s that the concepts were more rigidly specified and converted to a mathematical rigor by Professor Leontief at Harvard University. *Id.* at 69. He received a Nobel Prize for his work. *Id.* The use of input-output computer models came into common usage after World War II. *Id.* at 71. The methodology, that is, the mathematics, of these models is formalized in a textbook by Miller and Blair, now considered the "bible" for input-output analysts. RT



Vol. 185 at 72-73; RT Vol. 186 at 78; Kan. Exh. 953. Beginning in the 1970s, with the rapid development of computer power, it became possible to construct input-output models for regions based on data collected and assembled by the federal government and others. RT Vol. 185 at 74; RT Vol. 186 at 59-60. The regional model constructed and used by the Kansas experts in this case to compute secondary economic damages applies accepted Miller and Blair principles. RT Vol. 185 at 72-73.

The Kansas regional model was constructed by Dr. Robison. It begins with the use of an input-output modeling system known as IMPLAN. This is a framework which uses national level coefficients, and from that starting point IMPLAN can calculate an appropriate region-specific, input-output model. RT Vol. 185 at 81. IMPLAN was developed in the early 1980s by the U.S. Forest Service for use in land management impact planning and analysis. Kan. Exh. 892, Section D at 5. However, the IMPLAN model is now maintained by the U.S. Department of Commerce, Bureau of Economic Analysis. RT Vol. 186 at 57, 61-62. It is a model that includes extensive survey data for the entire United States economy, covering more than 500 sectors of economic detail. It shows who sells to whom, and who buys from whom. In essence, the input-output model is a very elaborate double-entry accounting system. The sales to various sectors across a row have to balance with purchases from each sector down the column. RT Vol. 186 at 57-58.

In 1987 a private corporation, the Minnesota IMPLAN Group, located at the University of Minnesota, began work on regional IMPLAN data and software. Kan. Exh. 962; RT Vol. 186 at 59. The group now maintains data

at the county level, including statistics on employment, income, dividends, interest, rents, transfer payments, earnings, and other kinds of information that are needed to build a model, and these data have been privatized. RT Vol. 186 at 59-60. More than 125 significant studies and research projects have used IMPLAN software and these regional data since they have become commercially available. *Id.* at 60. The Kansas input-output model developed by Dr. Robison takes the national model, couples it with region-specific information, and converts the national model into a regional input-output model for the State of Kansas. *Id.* at 62.

In 1996-97, the U.S. Department of Commerce, Economic Development Administration, assessed the economic impact of 175 of its recent public works projects. Dr. Robison was hired to do the economic modeling for this study, in association with Princeton and Rutgers Universities. He constructed 175 different IMPLAN models to conduct the work. RT Vol. 186 at 50. Dr. Robison is now working with the Economic Development Administration on a new study that will involve constructing between 800 and 900 county-level IMPLAN models. *Id.* at 51. In 1997 Dr. Robison worked for the Colorado Department of Transportation to build about 10 IMPLAN models for different subregions of the Colorado economy. *Id.* at 51-52. The record discloses many more examples of input-output modeling, but perhaps it is sufficient here merely to note that there was no challenge to the testimony that IMPLAN is the "most widely used" model for assessing secondary economic impacts. RT Vol. 185 at 80; RT Vol. 186 at 26. Numerous peer reviewed journal articles, a number of which were authored by



Professor Hamilton and Dr. Robison, also support the broad acceptance and reliability of imput-output modeling. Kan. Exhs. 938, 961.

There can be no doubt that evidence resulting from an input-output model analysis, and from IMPLAN in particular, meet the admissibility standards of *Daubert* and *Kumho Tire*. Colorado itself acknowledges that "input-output modeling rests upon a foundation which is generally recognized in the field of economics." Colo. Objection at 3. The Colorado position, however, is based upon a more discreet objection to IMPLAN, that is, whether it is sufficiently reliable to calculate secondary economic impacts going backwards for a period of 45 years, and forward for 50 years. This issue depends upon the use of "multipliers" within the modeling system.

Multipliers are computed from the input-output model and are used to show the effects of changes in an economy. RT Vol. 185 at 75. They translate the ripple effects of a primary impact on the economy into resulting impacts on various sectors of the economy. *Id.* The input-output model constructed by Kansas experts in this case is a snapshot of the Kansas economy in 1995. RT Vol. 186 at 74. The issue raised by Colorado is whether the multiplier relationships existing in 1995 are sufficiently stable to permit the model to be used for other years. Colorado raises the question, but has offered no evidence that IMPLAN cannot be used in this fashion. Dr. Robison's review of the literature indicates that the input-output coefficient tables are relatively stable and may be used for years. RT Vol. 186 at 77-79, 84-93. Dr. Robison cited examples of input-output models being used to look ahead 20 years and back almost that period of time. *Id.* at 92-97. If

the multipliers were not stable, they would be "going down" in Dr. Robison's opinion, and that would mean that the Kansas approach underestimates secondary economic impacts. *Id.* at 99. This testimony was given as part of Kansas' case in chief, and it was at the conclusion of Dr. Robison's cross-examination that Colorado made its *Daubert* objection.

In response, as part of its rebuttal case, Kansas produced evidence that the IMPLAN model is currently being used by the United States Corps of Engineers to look ahead 100 years. Kan. Exh. 1084; RT Vol. 206 at 35-36, 72-73. The study, dated November 1999, considers a series of alternatives for salmon recovery. These include the "breaching" of four dams on the lower Snake River which would essentially eliminate water storage, reducing the water supply available to agriculture and for hydro power. RT Vol. 206 at 33-34. Professor Hamilton, as chair of the Independent Economic Analysis Board of the Northwest Power Planning Council, provided technical review and oversight of these economic impact studies. This latest use of the IMPLAN model effectively responds to Colorado's argument that the Kansas evidence on secondary economic impacts is inadmissible when used over the time periods involved in this case.

Colorado also objects to the 20 percent limitation on the IMPLAN results imposed by the Kansas experts in order to limit secondary impacts to their net effect on the Kansas economy. However, that step is outside of the IMPLAN product. It is a judgment decision made by the input-output analyst, and is not part of the model nor the standards affecting its admissibility. RT Vol. 206 at 84-86.



The Colorado objection to the admissibility of expert testimony regarding secondary economic damages is hereby overruled. This Order applies to the admissibility and not to the weight of the testimony.

DATED: May 1, 2000.

/s/ Arthur L. Littleworth
ARTHUR L. LITTLEWORTH
Special Master

**PROOF OF SERVICE BY MAIL**

**STATE OF CALIFORNIA, COUNTY OF RIVERSIDE**

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years and not a party to the within entitled action; my business address is Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502.

I am readily familiar with Best, Best & Krieger's practice for collecting and processing correspondence for mailing with the United States Postal Service. Under that practice, all correspondence is deposited with the United States Postal Service the same day it is collected and processed in the ordinary course of business.

On May 1, 2000, I served the within **ORDER OVERRULING COLORADO'S OBJECTION TO THE ADMISSIBILITY OF EXPERT TESTIMONY REGARDING SECONDARY ECONOMIC DAMAGES** by placing a copy of the document in a separate envelope for each addressee named below and addressed to each such addressee as follows:

John B. Draper, Esq.
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James J. DuBois, Esq.
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General Litigation Section
999 18th Street, Suite 945
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On May 1, 2000, at the office of Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502, I sealed and placed each envelope for collection and deposit by Best, Best & Krieger in the United States Postal Service, following ordinary business practices.

I declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

Executed on May 1, 2000, at Riverside, California.

/s/ Sandra L. Simmons
Sandra L. Simmons

# APPENDIX – Exhibit 9

Stipulation filed November 23, 1998, Table 4B

# TABLE 4B
## Summary of Analysis to Estimate Impacts in Kansas caused by Depletions to Usable Stateline Flows
## Summary Total

| Compact Year | Compact Year | Historical | | | | | Depletions to Usable Stateline Flow | | | Allocation of depletions to Canals | | | | | | Canal Supply with Allocated Depletions | | | Historical | | Impacts of Reduced Deliveries | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Irrigated Area, ac | Historical Divs., af | FHG Delivery, af | Unit FHG (af/ac) | | Total af | Recharge af | Irrigation af | CIR Shortage | | Diversions af | FHG Delivery, af | Delivery Loss, af | Unit FHG Del (af/ac) | Total Divs., af | FHG Delivery | | Land served by Wells | | Additional Well Pumping, af | Farm Del. not Repl, af |
| | | | | | Requirmnt. | Delivery | | | | % of All Canals | af | | | | | | af | af/ac | acres | % | | |
| a | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | r | s | t | u | v |
| 1950 | 1950 | 50,839 | 94,208 | 63,824 | 2.09 | 1.26 | 186 | 22 | 164 | 100% | 31,920 | 164 | 106 | 57 | 0.00 | 94,372 | 63,930 | 1.26 | 22,209 | 43.7% | 45 | 61 |
| 1951 | 1951 | 50,799 | 74,588 | 49,976 | 1.85 | 0.98 | 1,154 | 177 | 977 | 100% | 30,245 | 977 | 644 | 333 | 0.01 | 75,565 | 50,621 | 1.00 | 22,730 | 44.7% | 282 | 362 |
| 1952 | 1952 | 50,759 | 61,442 | 42,808 | 3.33 | 0.84 | 939 | 163 | 776 | 100% | 83,100 | 776 | 518 | 258 | 0.01 | 62,218 | 43,326 | 0.85 | 23,251 | 45.8% | 257 | 262 |
| 1953 | 1953 | 50,719 | 92,086 | 63,788 | 2.04 | 1.26 | 2,229 | 348 | 1,881 | 100% | 33,745 | 1,881 | 1,235 | 646 | 0.02 | 93,967 | 65,023 | 1.28 | 23,772 | 46.9% | 614 | 621 |
| 1954 | 1954 | 50,679 | 72,001 | 47,641 | 3.30 | 0.94 | 4,552 | 683 | 3,869 | 100% | 78,853 | 3,869 | 2,615 | 1,254 | 0.05 | 75,870 | 50,256 | 0.99 | 24,294 | 47.9% | 1,375 | 1,241 |
| 1955 | 1955 | 50,638 | 111,273 | 72,725 | 2.88 | 1.44 | 9,467 | 1,441 | 8,026 | 100% | 51,126 | 8,026 | 5,403 | 2,623 | 0.11 | 119,298 | 78,128 | 1.54 | 24,815 | 49.0% | 2,891 | 2,512 |
| 1956 | 1956 | 50,598 | 76,199 | 53,891 | 3.31 | 1.07 | 9,445 | 1,548 | 7,897 | 100% | 76,534 | 7,897 | 5,192 | 2,705 | 0.10 | 84,096 | 59,083 | 1.17 | 25,336 | 50.1% | 2,732 | 2,460 |
| 1957 | 1957 | 50,558 | 126,077 | 83,028 | 2.25 | 1.64 | 4,259 | 1,208 | 3,051 | 100% | 24,272 | 3,051 | 1,988 | 1,063 | 0.04 | 129,128 | 85,017 | 1.68 | 25,857 | 51.1% | 961 | 1,028 |
| 1958 | 1958 | 50,518 | 82,614 | 59,689 | 2.06 | 1.18 | 6,251 | 2,350 | 3,901 | 100% | 32,854 | 3,901 | 2,417 | 1,485 | 0.05 | 86,516 | 62,106 | 1.23 | 26,378 | 52.2% | 1,184 | 1,233 |
| 1959 | 1959 | 50,478 | 131,563 | 90,324 | 2.04 | 1.79 | 1,226 | 344 | 882 | 100% | 13,181 | 882 | 486 | 395 | 0.01 | 132,445 | 90,810 | 1.80 | 26,899 | 53.3% | 230 | 256 |
| 1960 | 1960 | 50,438 | 56666 | 38,205 | 2.30 | 0.76 | 12,307 | 1,682 | 10,625 | 100% | 50,564 | 10,625 | 7,019 | 3,606 | 0.14 | 67,290 | 45,224 | 0.90 | 27,421 | 54.4% | 3,967 | 3,052 |
| 1961 | 1961 | 50,398 | 84841 | 55,578 | 2.05 | 1.10 | 9,213 | 1,511 | 7,702 | 100% | 31,540 | 7,702 | 4,973 | 2,729 | 0.10 | 92,543 | 60,551 | 1.20 | 27,942 | 55.4% | 2,840 | 2,132 |
| 1962 | 1962 | 50,358 | 78018 | 55,217 | 2.59 | 1.10 | 5,151 | 798 | 4,353 | 100% | 50,191 | 4,353 | 2,741 | 1,612 | 0.05 | 82,371 | 57,959 | 1.15 | 28,463 | 56.5% | 1,567 | 1,174 |
| 1963 | 1963 | 50,318 | 56531 | 35,578 | 2.65 | 0.71 | 9,601 | 1,428 | 8,173 | 100% | 63,767 | 8,173 | 5,480 | 2,693 | 0.11 | 64,704 | 41,058 | 0.82 | 28,984 | 57.6% | 3,331 | 2,149 |
| 1964 | 1964 | 50,277 | 40588 | 27,988 | 2.59 | 0.56 | 12,132 | 2,080 | 10,052 | 100% | 67,861 | 10,052 | 6,571 | 3,481 | 0.13 | 50,640 | 34,559 | 0.69 | 29,505 | 58.7% | 3,950 | 2,621 |
| 1965 | 1965 | 50,237 | 86551 | 56,300 | 1.57 | 1.12 | 20,964 | 4,024 | 16,940 | 100% | 14,620 | 16,940 | 10,939 | 6,002 | 0.22 | 103,491 | 67,239 | 1.34 | 30,026 | 59.8% | 8,270 | 2,669 |
| 1966 | 1966 | 50,197 | 157175 | 109,591 | 2.57 | 2.18 | 3,435 | 974 | 2,461 | 100% | 19,313 | 2,461 | 1,277 | 1,184 | 0.03 | 159,636 | 110,869 | 2.21 | 30,547 | 60.9% | 831 | 446 |
| 1967 | 1967 | 48,646 | 153982 | 109,176 | 1.91 | 2.24 | 2,721 | 681 | 2,040 | 100% | 9,414 | 2,040 | 819 | 1,221 | 0.02 | 156,022 | 109,995 | 2.26 | 29,519 | 60.7% | 461 | 358 |
| 1968 | 1968 | 48,595 | 91899 | 65,006 | 2.15 | 1.34 | 20,494 | 2,792 | 17,702 | 100% | 27,626 | 17,702 | 10,500 | 7,203 | 0.22 | 109,602 | 75,505 | 1.55 | 29,991 | 61.7% | 6,591 | 3,909 |
| 1969 | 1969 | 48,545 | 84185 | 56,089 | 1.68 | 1.16 | 9,228 | 1,480 | 7,748 | 100% | 16,999 | 7,748 | 4,745 | 3,003 | 0.10 | 91,933 | 60,834 | 1.25 | 30,464 | 62.8% | 3,308 | 1,437 |
| 1970 | 1970 | 45,558 | 97198 | 63,896 | 2.24 | 1.40 | 8,817 | 1,284 | 7,533 | 100% | 25,722 | 7,533 | 4,592 | 2,941 | 0.10 | 104,730 | 68,489 | 1.50 | 28,385 | 62.3% | 2,895 | 1,697 |
| 1971 | 1971 | 45,472 | 70000 | 46,561 | 1.65 | 1.02 | 8,815 | 1,374 | 7,441 | 100% | 21,402 | 7,441 | 4,634 | 2,807 | 0.10 | 77,441 | 51,195 | 1.13 | 28,769 | 63.3% | 2,871 | 1,763 |
| 1972 | 1972 | 45,386 | 72264 | 45,127 | 1.96 | 0.99 | 10,747 | 1,690 | 9,057 | 100% | 29,966 | 9,057 | 6,015 | 3,042 | 0.13 | 81,321 | 51,141 | 1.13 | 29,153 | 64.2% | 3,920 | 2,095 |
| 1973 | 1973 | 45,299 | 65260 | 42,515 | 2.25 | 0.94 | 6,782 | 1,212 | 5,570 | 100% | 38,926 | 5,570 | 3,617 | 1,954 | 0.08 | 70,830 | 46,132 | 1.02 | 29,537 | 65.2% | 2,432 | 1,185 |
| 1974 | 1974 | 45,213 | 40345 | 25,674 | 2.55 | 0.57 | 9,300 | 1,426 | 7,874 | 100% | 58,620 | 7,874 | 5,218 | 2,657 | 0.12 | 48,219 | 30,892 | 0.68 | 29,921 | 66.2% | 3,490 | 1,728 |
| 1975 | 1975 | 45,127 | 22941 | 16,670 | 2.16 | 0.37 | 14,582 | 2,681 | 11,901 | 100% | 53,082 | 11,901 | 7,801 | 4,100 | 0.17 | 34,842 | 24,471 | 0.54 | 30,305 | 67.2% | 5,318 | 2,482 |
| 1976 | 1976 | 45,040 | 10608 | 6,333 | 2.32 | 0.14 | 23,131 | 3,738 | 19,393 | 100% | 63,856 | 19,393 | 13,087 | 6,306 | 0.29 | 30,001 | 19,421 | 0.43 | 30,689 | 68.1% | 8,856 | 4,231 |
| 1977 | 1977 | 44,954 | 10905 | 7,961 | 1.70 | 0.18 | 18,443 | 3,081 | 15,362 | 100% | 44,633 | 15,362 | 10,358 | 5,004 | 0.23 | 26,267 | 18,319 | 0.41 | 31,073 | 69.1% | 7,164 | 3,195 |
| 1978 | 1978 | 44,868 | 23790 | 15,668 | 2.48 | 0.35 | 24,079 | 3,950 | 20,129 | 100% | 62,237 | 20,129 | 13,550 | 6,580 | 0.30 | 43,920 | 29,218 | 0.65 | 31,457 | 70.1% | 9,474 | 4,076 |
| 1979 | 1979 | 44,782 | 8262 | 6,499 | 2.07 | 0.15 | 23,442 | 3,827 | 19,615 | 100% | 55,909 | 19,615 | 13,105 | 6,511 | 0.29 | 27,878 | 19,603 | 0.44 | 31,841 | 71.1% | 9,288 | 3,817 |
| 1980 | 1980 | 44,695 | 69927 | 46,912 | 2.35 | 1.05 | 5,945 | 1,687 | 4,258 | 100% | 39,880 | 4,258 | 2,834 | 1,425 | 0.06 | 74,186 | 49,746 | 1.11 | 32,225 | 72.1% | 2,031 | 803 |
| 1981 | 1981 | 44,609 | 24099 | 18,845 | 2.01 | 0.42 | 8,427 | 1,624 | 6,80[illegible] | 100% | 47,960 | 6,803 | 4,480 | 2,323 | 0.10 | 30,901 | 23,325 | 0.52 | 32,609 | 73.1% | 3,261 | 1,219 |
| 1982 | 1982 | 44,523 | 43089 | 29,177 | 1.87 | 0.66 | 14,281 | 2,479 | 11,802 | 100% | 36,728 | 11,802 | 7,916 | 3,887 | 0.18 | 54,891 | 37,093 | 0.83 | 32,993 | 74.1% | 5,841 | 2,074 |
| 1983 | 1983 | 44,436 | 103810 | 68,607 | 2.16 | 1.54 | 3,097 | 879 | 2,218 | 100% | 17,780 | 2,218 | 1,399 | 819 | 0.03 | 106,029 | 70,006 | 1.58 | 33,377 | 75.1% | 1,051 | 348 |
| 1984 | 1984 | 44,350 | 117496 | 77,106 | 1.89 | 1.74 | 3,127 | 883 | 2,244 | 100% | 6,736 | 2,244 | 1,349 | 894 | 0.03 | 119,740 | 78,455 | 1.77 | 33,761 | 76.1% | 1,044 | 305 |
| 1985 | 1985 | 44,264 | 103734 | 69,597 | 2.31 | 1.57 | 0 | 0 | 0 | 100% | 21,363 | 0 | 0 | 0 | 0.00 | 103,734 | 69,597 | 1.57 | 34,145 | 77.1% | 0 | 0 |
| 1986 | 1986 | 44,178 | 136786 | 89,263 | 2.14 | 2.02 | 8,124 | 1,337 | 6,787 | 100% | 6,786 | 6,787 | 4,396 | 2,391 | 0.10 | 143,572 | 93,659 | 2.12 | 34,529 | 78.2% | 3,416 | 980 |
| 1987 | 1987 | 44,091 | 107563 | 75,002 | 1.98 | 1.70 | 1,916 | 705 | 1,211 | 100% | 10,293 | 1,211 | 661 | 550 | 0.01 | 108,774 | 75,662 | 1.72 | 34,913 | 79.2% | 561 | 100 |
| 1988 | 1988 | 44,005 | 129254 | 85,240 | 2.54 | 1.94 | 5,664 | 1,037 | 4,627 | 100% | 17,110 | 4,627 | 2,968 | 1,659 | 0.07 | 133,881 | 88,209 | 2.00 | 35,297 | 80.2% | 2,360 | 609 |
| 1989 | 1989 | 44,005 | 68459 | 46,141 | 1.53 | 1.05 | 7,174 | 1,304 | 5,870 | 100% | 14,620 | 5,870 | 3,885 | 1,986 | 0.09 | 74,329 | 50,026 | 1.14 | 35,297 | 80.2% | 3,064 | 820 |
| 1990 | 1990 | 44,005 | 43548 | 29,919 | 1.89 | 0.68 | 13,073 | 2,067 | 11,006 | 100% | 35,601 | 11,006 | 7,395 | 3,611 | 0.17 | 54,554 | 37,315 | 0.85 | 35,297 | 80.2% | 5,781 | 1,614 |
| 1991 | 1991 | 44,005 | 40106 | 26,883 | 2.02 | 0.61 | 16,685 | 2,662 | 14,023 | 100% | 40,843 | 14,023 | 9,561 | 4,462 | 0.22 | 54,130 | 36,444 | 0.83 | 35,297 | 80.2% | 7,429 | 2,132 |
| 1992 | 1992 | 44,005 | 47913 | 31,747 | 1.82 | 0.72 | 17,328 | 2,755 | 14,573 | 100% | 31,424 | 14,573 | 9,885 | 4,688 | 0.22 | 62,486 | 41,632 | 0.95 | 35,297 | 80.2% | 7,653 | 2,233 |
| 1993 | 1993 | 44,005 | 53952 | 36,175 | 1.85 | 0.82 | 8,448 | 1,540 | 6,908 | 100% | 29,268 | 6,908 | 4,666 | 2,242 | 0.11 | 60,860 | 40,841 | 0.93 | 35,297 | 80.2% | 3,667 | 999 |
| 1994 | 1994 | 44,005 | 66798 | 45,723 | 1.81 | 1.04 | 13,690 | 2,265 | 11,425 | 100% | 22,201 | 11,425 | 7,523 | 3,902 | 0.17 | 78,223 | 53,245 | 1.21 | 35,297 | 80.2% | 5,972 | 1,551 |
| *AVERAGE* | *AVERAGES:* | | | | | | | | | | | | | | | | | | | | | |
| 1950-85 | 1950-85 | 47,866 | 74,895 | 50,655 | 2.25 | 1.06 | 9,110 | 1,599 | 7,512 | 100% | 39,792 | 7,512 | 4,878 | 2,633 | 0.10 | 82,407 | 55,533 | 1.16 | 28,851 | 60.3% | 3,184 | 1,694 |
| 1986-94 | 1986-94 | 44,034 | 77,153 | 51,788 | 1.95 | 1.18 | 10,234 | 1,741 | 8,492 | 100% | 23,127 | 8,492 | 5,660 | 2,832 | 0.13 | 85,646 | 57,448 | 1.30 | 35,169 | 79.9% | 4,434 | 1,226 |
| 1950-94 | 1950-94 | 47,099 | 75,347 | 50,881 | 2.19 | 1.08 | 9,335 | 1,627 | 7,708 | 100% | 36,459 | 7,708 | 5,035 | 2,673 | 0.11 | 83,054 | 55,916 | 1.19 | 30,115 | 63.9% | 3,434 | 1,601 |
| *TOTALS:* | *TOTALS:* | | | | | | | | | | | | | | | | | | | | | |
| 1950-85 | 1950-85 | 1,723,171 | 2,696,216 | 1,823,569 | | 1.06 | 327,969 | 57,549 | 270,420 | | 1,432,525 | 270,420 | 175,623 | 94,797 | 0.10 | 2,966,636 | 1,999,193 | 1.16 | 1,038,648 | | 114,624 | 60,999 |
| 1986-94 | 1986-94 | 396,304 | 694,380 | 466,093 | | 1.18 | 92,103 | 15,672 | 76,431 | | 208,146 | 76,431 | 50,939 | 25,491 | 0.13 | 770,810 | 517,032 | 1.30 | 316,521 | | 39,903 | 11,037 |
| 1950-94 | 1950-94 | 2,119,475 | 3,390,596 | 2,289,662 | | 1.08 | 420,071 | 73,221 | 346,850 | | 1,640,671 | 346,850 | 226,563 | 120,288 | 0.11 | 3,737,446 | 2,516,225 | 1.19 | 1,355,170 | | 154,526 | 72,036 |

**TABLE 4B - Part 2**
**Summary of Analysis to Estimate Impacts in Kansas caused by Depletions to Usable Stateline Flows**
**Summary Total**

| | |
|---|---|
| Nonbeneficial CU (SEV): | 27% |
| Farm Irrigation Efficiency | 65% |
| Tail Water (% FHG) | 10% |

| Compact Year | Net Reduction in Recharge - Details | | | | | | | | | | Change in SEV, af | Net Reduction in Recharge Summary | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Delivery Loss | | | Farm Delivery Losses | | | Pumping Consumptive Use | | | Irrigation | | Canal Service Area | | | | | River | Grand |
| | Rchg, af | SEV, af | Total, af | Rchg, af | SEV, af | Total, af | Crop CU, af | SEV, af | Total, af | Rchg, af | | Ditch Loss, af | Reservoir Seep, af | Farm Delivery, af | Pumping CU, af | Total af | Loss, af | Total, af |
| a | w | x | y | z | aa | ab | ac | ad | ae | af | ag | ah | ai | aj | ak | al | | |
| 1950 | 32 | 25 | 57 | 34 | 3 | 37 | 29 | 1 | 31 | 97 | 27 | 31 | 1 | 34 | 31 | 97 | 22 | 119 |
| 1951 | 181 | 152 | 333 | 208 | 17 | 225 | 184 | 8 | 191 | 580 | 162 | 172 | 9 | 208 | 191 | 580 | 177 | 757 |
| 1952 | 147 | 111 | 258 | 167 | 14 | 181 | 167 | 7 | 174 | 488 | 118 | 141 | 6 | 167 | 174 | 488 | 163 | 651 |
| 1953 | 372 | 274 | 646 | 399 | 33 | 432 | 399 | 17 | 416 | 1,186 | 291 | 358 | 14 | 399 | 416 | 1,186 | 348 | 1,534 |
| 1954 | 726 | 528 | 1,254 | 845 | 71 | 915 | 894 | 37 | 931 | 2,501 | 562 | 699 | 27 | 845 | 931 | 2,501 | 683 | 3,184 |
| 1955 | 1,525 | 1,098 | 2,623 | 1,745 | 146 | 1,891 | 1,879 | 78 | 1,957 | 5,227 | 1166 | 1,469 | 55 | 1,745 | 1,957 | 5,227 | 1,441 | 6,668 |
| 1956 | 1,521 | 1,183 | 2,705 | 1,677 | 140 | 1,817 | 1,776 | 74 | 1,850 | 5,048 | 1250 | 1,457 | 64 | 1,677 | 1,850 | 5,048 | 1,548 | 6,596 |
| 1957 | 589 | 474 | 1,063 | 642 | 54 | 696 | 624 | 26 | 650 | 1,881 | 502 | 562 | 27 | 642 | 650 | 1,881 | 1,208 | 3,089 |
| 1958 | 763 | 722 | 1,485 | 781 | 65 | 846 | 769 | 32 | 801 | 2,345 | 756 | 717 | 46 | 781 | 801 | 2,345 | 2,350 | 4,695 |
| 1959 | 192 | 204 | 395 | 157 | 13 | 170 | 149 | 6 | 156 | 504 | 211 | 178 | 14 | 157 | 156 | 504 | 344 | 848 |
| 1960 | 2,018 | 1,588 | 3,606 | 2,267 | 190 | 2,457 | 2,579 | 107 | 2,686 | 6,971 | 1670 | 1,930 | 87 | 2,267 | 2,686 | 6,971 | 1,682 | 8,653 |
| 1961 | 1,491 | 1,238 | 2,729 | 1,606 | 134 | 1,740 | 1,846 | 77 | 1,923 | 5,020 | 1295 | 1,420 | 71 | 1,606 | 1,923 | 5,020 | 1,511 | 6,531 |
| 1962 | 862 | 750 | 1,612 | 885 | 74 | 960 | 1,019 | 42 | 1,061 | 2,808 | 781 | 817 | 45 | 885 | 1,061 | 2,808 | 798 | 3,606 |
| 1963 | 1,548 | 1,145 | 2,693 | 1,770 | 148 | 1,918 | 2,165 | 90 | 2,255 | 5,573 | 1203 | 1,488 | 59 | 1,770 | 2,255 | 5,573 | 1,428 | 7,001 |
| 1964 | 1,937 | 1,544 | 3,481 | 2,122 | 177 | 2,300 | 2,568 | 107 | 2,674 | 6,733 | 1615 | 1,851 | 86 | 2,122 | 2,674 | 6,733 | 2,080 | 8,813 |
| 1965 | 2,970 | 3,032 | 6,002 | 3,533 | 295 | 3,829 | 5,375 | 223 | 5,599 | 12,101 | 3104 | 2,769 | 201 | 3,533 | 5,599 | 12,101 | 4,024 | 16,125 |
| 1966 | 497 | 687 | 1,184 | 413 | 34 | 447 | 540 | 22 | 563 | 1,472 | 699 | 445 | 52 | 413 | 563 | 1,472 | 974 | 2,446 |
| 1967 | 481 | 740 | 1,221 | 265 | 22 | 287 | 300 | 12 | 312 | 1,058 | 749 | 423 | 58 | 265 | 312 | 1,058 | 681 | 1,739 |
| 1968 | 3,664 | 3,538 | 7,203 | 3,391 | 283 | 3,675 | 4,284 | 178 | 4,462 | 11,518 | 3644 | 3,438 | 227 | 3,391 | 4,462 | 11,518 | 2,792 | 14,310 |
| 1969 | 1,496 | 1,507 | 3,003 | 1,533 | 128 | 1,661 | 2,150 | 89 | 2,240 | 5,268 | 1545 | 1,397 | 99 | 1,533 | 2,240 | 5,268 | 1,480 | 6,748 |
| 1970 | 1,539 | 1,401 | 2,941 | 1,483 | 124 | 1,607 | 1,882 | 78 | 1,960 | 4,983 | 1447 | 1,453 | 86 | 1,483 | 1,960 | 4,983 | 1,284 | 6,267 |
| 1971 | 1,528 | 1,279 | 2,807 | 1,497 | 125 | 1,622 | 1,866 | 78 | 1,944 | 4,969 | 1326 | 1,454 | 74 | 1,497 | 1,944 | 4,969 | 1,374 | 6,343 |
| 1972 | 1,762 | 1,280 | 3,042 | 1,943 | 162 | 2,105 | 2,548 | 106 | 2,654 | 6,359 | 1336 | 1,697 | 65 | 1,943 | 2,654 | 6,359 | 1,690 | 8,049 |
| 1973 | 1,106 | 848 | 1,954 | 1,168 | 98 | 1,266 | 1,581 | 66 | 1,646 | 3,920 | 880 | 1,061 | 46 | 1,168 | 1,646 | 3,920 | 1,212 | 5,132 |
| 1974 | 1,544 | 1,112 | 2,657 | 1,685 | 141 | 1,826 | 2,268 | 94 | 2,362 | 5,592 | 1159 | 1,488 | 56 | 1,685 | 2,362 | 5,592 | 1,426 | 7,018 |
| 1975 | 2,347 | 1,753 | 4,100 | 2,520 | 211 | 2,730 | 3,457 | 144 | 3,601 | 8,467 | 1821 | 2,255 | 92 | 2,520 | 3,601 | 8,467 | 2,681 | 11,148 |
| 1976 | 3,697 | 2,608 | 6,306 | 4,227 | 353 | 4,581 | 5,757 | 239 | 5,996 | 13,920 | 2722 | 3,569 | 129 | 4,227 | 5,996 | 13,920 | 3,738 | 17,658 |
| 1977 | 3,521 | 1,482 | 5,004 | 3,346 | 280 | 3,625 | 4,656 | 193 | 4,850 | 11,717 | 1568 | 3,000 | 522 | 3,346 | 4,850 | 11,717 | 3,081 | 14,798 |
| 1978 | 4,636 | 1,943 | 6,580 | 4,377 | 366 | 4,742 | 6,158 | 256 | 6,414 | 15,427 | 2053 | 3,973 | 664 | 4,377 | 6,414 | 15,427 | 3,950 | 19,377 |
| 1979 | 4,582 | 1,928 | 6,511 | 4,233 | 354 | 4,587 | 6,037 | 251 | 6,288 | 15,103 | 2031 | 3,904 | 678 | 4,233 | 6,288 | 15,103 | 3,827 | 18,930 |
| 1980 | 1,004 | 420 | 1,425 | 915 | 77 | 992 | 1,320 | 55 | 1,375 | 3,295 | 442 | 862 | 142 | 915 | 1,375 | 3,295 | 1,687 | 4,982 |
| 1981 | 1,631 | 691 | 2,323 | 1,447 | 121 | 1,568 | 2,119 | 88 | 2,208 | 5,286 | 724 | 1,375 | 256 | 1,447 | 2,208 | 5,286 | 1,624 | 6,910 |
| 1982 | 2,741 | 1,145 | 3,887 | 2,557 | 214 | 2,771 | 3,797 | 158 | 3,955 | 9,253 | 1201 | 2,360 | 381 | 2,557 | 3,955 | 9,253 | 2,479 | 11,732 |
| 1983 | 576 | 243 | 819 | 452 | 38 | 490 | 683 | 28 | 711 | 1,740 | 252 | 489 | 87 | 452 | 711 | 1,740 | 879 | 2,619 |
| 1984 | 623 | 271 | 894 | 436 | 36 | 472 | 679 | 28 | 707 | 1,766 | 280 | 503 | 119 | 436 | 707 | 1,766 | 883 | 2,649 |
| 1985 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1986 | 1,674 | 717 | 2,391 | 1,420 | 119 | 1,539 | 2,221 | 92 | 2,313 | 5,407 | 743 | 1,391 | 283 | 1,420 | 2,313 | 5,407 | 1,337 | 6,744 |
| 1987 | 376 | 175 | 550 | 213 | 18 | 231 | 364 | 15 | 380 | 969 | 177 | 272 | 104 | 213 | 380 | 969 | 705 | 1,674 |
| 1988 | 1,162 | 496 | 1,659 | 959 | 80 | 1,039 | 1,534 | 64 | 1,597 | 3,718 | 513 | 969 | 193 | 959 | 1,597 | 3,718 | 1,037 | 4,755 |
| 1989 | 1,401 | 585 | 1,986 | 1,255 | 105 | 1,360 | 1,992 | 83 | 2,075 | 4,730 | 607 | 1,207 | 194 | 1,255 | 2,075 | 4,730 | 1,304 | 6,034 |
| 1990 | 2,558 | 1,053 | 3,611 | 2,389 | 200 | 2,588 | 3,758 | 156 | 3,914 | 8,860 | 1097 | 2,246 | 311 | 2,389 | 3,914 | 8,860 | 2,067 | 10,927 |
| 1991 | 3,166 | 1,296 | 4,462 | 3,088 | 258 | 3,346 | 4,829 | 201 | 5,029 | 11,284 | 1353 | 2,804 | 362 | 3,088 | 5,029 | 11,284 | 2,662 | 13,946 |
| 1992 | 3,319 | 1,369 | 4,688 | 3,193 | 267 | 3,460 | 4,974 | 207 | 5,181 | 11,693 | 1429 | 2,910 | 409 | 3,193 | 5,181 | 11,693 | 2,755 | 14,448 |
| 1993 | 1,590 | 652 | 2,242 | 1,507 | 126 | 1,633 | 2,384 | 99 | 2,483 | 5,580 | 679 | 1,406 | 185 | 1,507 | 2,483 | 5,580 | 1,540 | 7,120 |
| 1994 | 2,756 | 1,147 | 3,902 | 2,430 | 203 | 2,633 | 3,882 | 161 | 4,043 | 9,228 | 1189 | 2,385 | 371 | 2,430 | 4,043 | 9,228 | 2,265 | 11,493 |
| *AVERAGE* | | | | | | | | | | | | | | | | | | |
| 1950-85 | 1,551 | 1,082 | 2,633 | 1,576 | 132 | 1,707 | 2,070 | 86 | 2,156 | 5,283 | 1,128 | 1,422 | 129 | 1,576 | 2,156 | 5,283 | 1,599 | 6,881 |
| 1986-94 | 2,000 | 832 | 2,832 | 1,828 | 153 | 1,981 | 2,882 | 120 | 3,002 | 6,830 | 865 | 1,732 | 268 | 1,828 | 3,002 | 6,830 | 1,741 | 8,571 |
| 1950-94 | 1,641 | 1,032 | 2,673 | 1,626 | 136 | 1,762 | 2,232 | 93 | 2,325 | 5,592 | 1,075 | 1,484 | 157 | 1,626 | 2,325 | 5,592 | 1,627 | 7,219 |
| *TOTALS:* | | | | | | | | | | | | | | | | | | |
| 1950-85 | 55,849 | 38,948 | 94,797 | 56,726 | 4,742 | 61,468 | 74,506 | 3,095 | 77,600 | 190,176 | 40,594 | 51,203 | 4,646 | 56,726 | 77,600 | 190,176 | 57,549 | 247,725 |
| 1986-94 | 18,002 | 7,489 | 25,491 | 16,453 | 1,375 | 17,829 | 25,937 | 1,077 | 27,014 | 61,470 | 7,787 | 15,590 | 2,412 | 16,453 | 27,014 | 61,470 | 15,672 | 77,142 |
| 1950-94 | 73,851 | 46,437 | 120,288 | 73,180 | 6,117 | 79,297 | 100,442 | 4,172 | 104,614 | 251,645 | 48,382 | 66,793 | 7,058 | 73,180 | 104,614 | 251,645 | 73,221 | 324,866 |



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